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THE DEVELOPMENT OF MEDICINE AND ITS TRENDS IN THE UNITED STATES, 1636-1936

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BALTIMORE

IT IS indeed a pleasure and privilege to be able to participate in the tercentenary celebration of this great and beautiful city, and I am particularly pleased with the fact that the medical profession has been given such a prominent place in this celebration. A few hours ago we deposited a wreath at the grave of the first doctor whose name has been recorded in this city. This was not a mere gesture. It had a profound significance, since it showed that not only are the noted doctors who make the outstanding discoveries remembered, but the humble practitioner as well — the practitioner who puts their teachings into practice. It showed also that we medical men, wherever we may stand, are members of one family. We know little about Dr. Leonard's life and work, but we know that he was a physician, that he was one of us, serving the same ideals that we serve.

Three hundred years is a short period in history, yet what tremendous changes have been brought about during that time! Three hundred years ago came the first settlers, William Pynchon sailing up the river, landing here and founding a new Springfield; today we see a thriving city with many industries, beautiful homes, numerous hospitals, and sixteen medical organizations. Three hundred years ago in this vast country were virgin forests, prairies and deserts, all inhabited by a few Indians. Today there are highways and railroads everywhere, large cities, a highly developed industry producing forty per cent of the world's output. If there ever was an epic in the history of mankind, the conquest and the opening up of the American Continent was such an epic, infinitely more dramatic than the Trojan War.

Just as interesting as the history of the American continent is the history of American medicine. I must confess that ten years ago I knew little about American medicine. Some of this country's outstanding contributions were known to me, as to everybody else — anesthesia, some new operations, the work of Gerhard, Nathan Smith and a few other men. I used daily the *Index Catalogue* of the Library of the Surgeon-General's Office, by far the best medical bibliography existing; that it was produced in an army office is a fact unparalleled in history. I had friends in America, among them Colonel Fielding H. Garrison, who has contributed so much to the history of medicine. The inspiration to study this history came to me from Dr. William H. Welch, who in 1927 visited me at the University of Leipzig. He told me of his plan to establish an Institute of the History of Medicine at Johns Hopkins University. He told me of his own work that is so intimately connected with half a century of American medicine, and invited me to be visiting lecturer at Johns Hopkins some day when the new institute was functioning. I had no idea at that time that I should be called to succeed Dr. Welch in the chair of the history of medicine, but I devoted a number of years reading everything on the subject I could find, and studying the books of American medical pioneers. Since then I have traveled all over this country, and my interest in American medicine has been ever increasing. Our Institute will begin publishing this year a series of reprints of American classics that should be in the hands of every doctor.

What makes the history of American medicine so fascinating is that in various periods tremendous difficulties had to be overcome — difficulties due to the size of the country, to its rapid expansion, to the general problems of colonization. We should expect that a new country would be able to take advantage of all the experiences of the older countries. The settlers who colonized America were Europeans, in full possession of the benefits of European civilization. We should expect them to have continued the cultural life of Europe at the point where they had left it. Yet we must not

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forget that civilization depends not only on men but also on institutions. England had its Oxford and Cambridge, and had had them since the Middle Ages. There were libraries all over Europe, and they had been there since the early Middle Ages. There are still libraries in Europe containing manuscripts written more than ten centuries ago. There were medical schools all over western Europe. And western Europe, besides, was a small territory where the young men eager to learn could easily travel from one center of learning to another. Here in America there was wilderness, hostile Nature, hostile Indians. Physicians and books were rare, and the settlers were poor. They had to start at the bottom. In three hundred years American medicine repeated the development of three thousand years of European medicine in all its phases.

If we look at conditions during the Colonial period, we find the parallelism between European and American development most strongly marked. During the early Middle Ages the medical man was as a rule a cleric, and in the same way there was a period of clerical medicine in New England. The clerics represented the educated part of the population. They were called upon to give help in the case of illness, and the chronicles have transmitted the names of quite a few of them, including Deacon Samuel Fuller, Thomas Thacher and Cotton Mather. Sometimes a governor was asked for advice in case of sickness, as is interestingly revealed, for example, in the correspondence of John Winthrop, Jr. There was a period in ancient Greece when physicians were craftsmen, educated as such by serving a master as apprentice for a number of years. At the time of the American Revolution there were about three thousand five hundred physicians in the colonies, of which not more than four hundred were graduates of universities; the others, like the disciples of Hippocrates, had been educated by serving apprenticeships with physicians, a system which undoubtedly had some advantages. While in Europe medicine and surgery were entirely different arts, often antagonistic, in America physician and surgeon were one, and even late in the nineteenth century the surgeon usually had a general practice as well.

Another parallel is to be found in the development of hospitals. The European "hospitals" in the early Middle Ages were xenodochia — guesthouses, poorhouses to provide food and shelter to the indigent. Medical treatment in such places was merely incidental. It was not until much later that true hospitals were erected. In this country as early as 1612 such a guesthouse was built in Henricopolis, Virginia. An almshouse was founded in 1732 in Philadelphia, and similar institutions were created in New York and New Orleans in 1736. They were not hospitals in the modern sense of the word, but poorhouses similar to the old European xenodochia. The first real hospital was the Pennsylvania Hospital, which was opened in 1752, and was succeeded by the New York Hospital in 1791.

In the same way, the first medical text printed in the colonies was not a textbook but a broadside — Thomas Thacher's *A Brief Rule to Guide the Common People of New-England: How to order themselves and theirs in the small pocks, or measels,* — just as the incunabulum of European medicine was not a large book but a single leaf with instructions for venesection, printed in 1456.

If medicine in the early colonial days appears somewhat primitive, we must not forget that it was not on a much higher standard in Europe. What was the medical situation in 1636? Eight years had passed since Harvey had made known his discovery of the circulation of the blood. The experimental approach to medical problems had just been initiated. Less than a century had passed since Vesalius had published his seven books on the structure of the human body, laying the foundation for a new system of medicine. While science — and primarily physics and chemistry — was applied more and more to the solution of biological problems in the seventeenth century, a work that centered in the academies founded during the century, medical practice was then on a rather low level, and not without justification were the physicians of the time satirized by the poets. It was only from the middle of the century on, and chiefly under the influence of Thomas Sydenham, that the standard of practice was raised.

The development of medicine in the colonies was perfectly sound. Every effort was made to create institutions that would compare favorably with those in Europe. The spirit of the colonies was progressive, as is shown by the fact that inoculation for smallpox was introduced in Boston as early as 1721, before anyone had been inoculated in western Europe. The new Pennsylvania Hospital compared favorably with most of the similar European institutions. It was carefully planned, and the men responsible for this and other new hospitals went abroad to study conditions there; their reports are most revealing. They were most anxious to avoid the mistakes made abroad. The first medical school founded in this country — in Philadelphia in 1765 — was better than many European ones. With Morgan, Rush, Shippen, Adam Kuhn and Bond it had a faculty of men well trained abroad and full of enthusiasm for their task. The school was not intended to replace the apprentice system; it completed the

student's medical education. A young man still went to a physician as apprentice for a number of years, and then entered medical school to integrate his knowledge and to study the theory of medicine. The hygienic movement that swept over Europe in the second half of the eighteenth century found its immediate repercussion in America, where philanthropists like Benjamin Franklin and Benjamin Rush were strong supporters of such reform.

After the American Revolution medicine had to face fresh problems. The country expanded westward. The frontier became a decisive factor in American life, and was pushed forward relentlessly. The population increased very rapidly and new territories of tremendous dimensions had to be conquered and settled. We find fascinating personalities in medicine in these frontier days — men like Ephraim McDowell, who in 1809 performed the first ovariotomy in a log cabin in Kentucky, and William Beaumont, who studied the gastric juices while stationed at a frontier fort. Most impressive of all to me is Daniel Drake. Morgan, Rush, McDowell even, had been trained abroad; Daniel Drake was a pure product of the American soil. Brought up in Kentucky, and trained in Cincinnati, he had a clear vision of the future task of medicine. He recognized that the Mississippi Valley was to be the melting pot of the nation. What part was the physician to play in this development? No doubt the country would require more physicians, many more than the Eastern schools were able to train. New schools would have to be founded. Drake himself was an enthusiastic teacher. There was hardly a subject in medicine that he did not teach. Called to academic positions thirteen times, he occupied nine chairs in five medical schools, and founded two schools. Drake then visualized another serious task. This enormous new territory that was to be a livingplace for millions of people would have to be made a healthful country to live in. Sanitation, however, required knowledge, and not only medical knowledge but knowledge of the geographic, climatic, ethnologic and social conditions of the region. Drake himself undertook such a study, and his treatise on the diseases of the Mississippi Valley is one of the classics of medical literature.

This sudden development of medicine had serious drawbacks, as it prevented a gradual and normal movement. More physicians were needed, and more and more schools were created. About four hundred medical schools were founded during the nineteenth century — twenty-seven in Indiana, thirty-nine in Illinois and not less than forty-two in Missouri. It is obvious that most of these schools could not be of very high standard. Everywhere doctors joined in the movement, rented rooms, admitted students and gave diplomas to men who had spent hardly two years in study. Still more serious was the abandonment of the apprentice system. The schools no longer completed the student's education, as they had done in colonial times. No wonder that the standards of these hurriedly trained physicians were low. There were some distinguished doctors in this period, as there had been before, but the average physician was poorly prepared. At the time of the Civil War, when in Europe medicine was progressing with gigantic strides, medical conditions in America were chaotic.

After the Civil War a readjustment took place. This was a slow process, entailing endless difficulties. American society was busy developing material resources, building up industries, improving the standard of living. Science pursued for science's sake found little response. In 1876 John Billings wrote: "Culture, to flourish, requires appreciation and sympathy, to such an extent, at least, that its utterances shall not seem to its audience as if in an unknown tongue."

The readjustment came from three different sources — the medical profession, the state medical societies and the medical schools. The profession as such felt that conditions must be changed if the profession was to have a respected place in society. As early as 1845 the Medical Society of the State of New York invited every medical society and school of medicine in the Union to send delegates to a general congress of physicians to be held in New York, at which ways and means of improving conditions in medicine were to be discussed. Another congress was held the following year in Philadelphia, and led to the foundation of the American Medical Association in 1847. Resolutions were passed but nothing was achieved. The Civil War interrupted this development, but the foundation of the American Medical Association had a decided significance in providing a forum for discussion and awakening the conscience of physicians. Local societies were organized in increasing numbers, and in the readjustment after the War these societies played an important part.

Another effort to improve conditions was made by the states in requiring a state license for the practice of medicine. Recognizing that the diplomas issued by the schools had little value, the states examined candidates through their boards of registration. This was not new in American medicine, for New Jersey had required a license as early as 1772; but here again a sound development had been interrupted, and one hundred years had to elapse before the requirement of a state license became general. Texas was the first state after the War to require a license.

in 1873. Others followed in rapid succession, so that by 1895 practically all the states had laid down similar requirements.

But it was not enough to postulate better standards. Places had to be created for the training of fully qualified physicians. This is what gave to Johns Hopkins Medical School, opened in 1893, its national significance. It was founded primarily as a center of medical research, and was equipped with all the facilities required for such research. The student body was small, the requirements for admittance were high, and the teaching staff included some of the best men in the nation, among them William Welch, William Osler, William Halsted, Howard Kelly, John Abel, Franklin Mall and William Howell — men who had had the best training that Europe could give, and who transplanted the spirit of the European universities to America without slavishly copying their methods. They succeeded in improving upon the European systems of medicine, blending the principles of German, English and French schools in a most fortunate way. Most of these men have left us today, but their spirit still lives as an inspiration to the school. The example set by the Johns Hopkins Medical School was soon followed by other schools. The curricula were thoroughly reorganized, and in 1901 the Rockefeller Institute for Medical Research was founded.

Today medical research is carried out by thousands of young people with tremendous enthusiasm. We have excellent schools, and as a result, well-trained physicians, nurses and public-health officers. American medicine gave the world the public-health nurse, whose value for the people's health cannot be overestimated. The standard of the hospitals was materially raised through the efforts of influential organizations like the American College of Surgeons, the American Medical Association, and others. The new medical science required a new type of hospital, serving not only the indigent sick but all classes of the population. It is no exaggeration to state that American medicine today is without doubt the best-equipped in the world.

Does this mean that all problems have been solved, that we can look back on the past with self-satisfaction? By no means; on the contrary, it seems to me that in our day a new frontier has opened up and must be settled. We have all the equipment that we can wish for; our problem is to apply it so as to benefit the entire population.

As we have seen, the whole development was chaotic and unplanned; one result was that the number of physicians increased tremendously, so that we now have one for every 760 inhabitants. Have we too many? I do not think so; for medicine has many more tasks to solve than it ever had before. If it has had a distinguished past, it has a still more distinguished future. Public health has developed very rapidly, assuming more and more tasks, and coming ever nearer to the individual. The physician's expert advice is sought in education, in the prevention of crime, in the enforcement of law. Serious public-health problems have been solved. Spectacular diseases like plague, yellow fever, smallpox and typhus have been overcome; but there are still tuberculosis and the venereal diseases; the hygienic problems of housing and nutrition remain unsolved. Hygiene and public health had to overcome great difficulties in this country, owing to its size and to its heterogeneous population, but they could build upon the solid foundation of a rational philosophy, and a democratic political organization in which the welfare of the individual has extreme weight.

We have to realize that conditions are very different from what they were half a century ago. Medical science has become extremely technical and specialized. As a result, medical service has become increasingly expensive. At the same time, the structure of society has undergone profound changes. The frontier has come to an end, and immigration has virtually stopped, so that American society, formerly in constant flux, has become stabilized. A paradoxical situation is developing in that medicine through its own progress is becoming too expensive, and therefore unavailable to large sections of the population. Another adjustment will have to take place. This time, it is not a matter of equipment and science, but a social problem that must be solved.

But I am confident that the American people will solve this problem as they have solved others. For this is a wonderful country, inhabited by fine men, intelligent, hard-working, with a plentiful endowment of common sense and idealism. The spirit of the men who three hundred years ago founded this city, of the men who in three hundred years have developed it to what it is today, and of the medical men who for three hundred years have devoted their lives to improving the people's health, is not dead. It is alive, ready to improve conditions, to create new values, conscious both of the heritage of the past and of the tasks that lie ahead.

RENAL CANCER

End Results in 105 Consecutive Cases

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THIS study is a continuation of the excellent report of the end results on hypernephroma published by Smith in 1925. From the beginning of 1925 to the end of 1935, 105 patients on whom a definite diagnosis of renal cancer was made were admitted to the Massachusetts General Hospital. This series includes only those cases where the diagnosis was verified by the pathologist, or where a characteristic pyelogram was supported by sufficient clinical evidence.

Of these 105 patients, 72 were submitted to a nephrectomy, 10 had an exploratory operation, 3 had biopsies, and in 20 cases no operation was done. End results are available in all but 6 cases. Of the patients who had nephrectomies (Table 1), 45

Table 1. *End Results of Nephrectomies for Renal Cancer.*

END RESULT	TIME	NO. OF CASES
Dead		45
	First yr.	37
	2 to 3 yr.	3
	5 yr.	2
	7 yr.	1
	8 yr.	1
	14 yr.	1
Living		22
	1 to 2 yr.	3
	2 to 3 yr.	4
	3 to 4 yr.	5
	4 to 5 yr.	3
	5 yr.	4
	6 to 7 yr.	2
	9 to 10 yr.	1
No follow-up		5
Total		72

are dead, 22 are living, and there are no follow-up reports in 5 cases. Of the 45 dead, 37 died within the first year, 3 within the second and third years, and 5 developed metastases after five years. Of the 22 living patients, 7 have gone beyond the five-year period, 10 have passed the fourth year, and 5 are living and well without demonstrable clinical recurrence after three years.

An exploratory operation was performed on 10 patients (Table 2); 4 of these died following the exploration, and 6 died at home within the first six months. Of the 3 patients on whom the diagnosis was made by biopsy, 2 died — 1 three months after the biopsy and 1 six years after it (the latter case illustrates how slow-growing some adenocarcinomas and hypernephromas can be); no follow-up is available in 1 case. All 20 unoperated patients died within fifteen months except 1, who lived for three years.

The histopathology of this series (Table 3) showed 7 Wilms's tumors in children, 5 adult sarcomas, 1 epidermoid and 7 papillary carcinomas of the renal pelvis, and 65 adenocarcinomas or hypernephromas. In the 20 unoperated cases no pathological report was available, as the diagnosis of renal tumor was made by pyelogram, and clinical signs and symptoms. All the children with a Wilms's tumor died within six months after the nephrectomy. Of the 5 adults with sarcoma, 4 died within the first year, and 1 lived two years and nine months and died in diabetic coma. This patient had no demonstrable recurrence. Four of the 7 patients with a papillary carcinoma of the renal pelvis are living — six years, four years and six months, three years and three months and fifteen months, respectively. The single patient with an epidermoid carcinoma of the renal pelvis

Table 2. *End Results of Cases without Operation and Those Explored and Biopsied.*

	NO OPERATION	EXPLORATION	BIOPSY
Died in hospital	7	4	0
Died after discharge			
1-6 mo.	9	6	1
6-12 "	2	0	0
15 "	1	0	0
3 yr.	1	0	0
6 "	0	0	1
No follow-up	0	0	1
Totals	20	10	3

Table 3. *End Results in Cases of Renal Cancer, Arranged According to Type of Tumor.*

TYPE OF TUMOR	NO. OF CASES	END RESULTS
Wilms's tumor (children)	7	All dead.
Sarcoma (adults)	5	All dead; 1 lived 2 yr. 9 mo. and died of diabetes.
Epidermoid carcinoma of renal pelvis	1	Living over 5 yr.; no clinical evidence of recurrence.
Papillary carcinoma of renal pelvis	7*	Four living and well (6 yr., 4 yr. 6 mo., 3 yr. 3 mo. and 1 yr. 3 mo., respectively). Two died postoperatively; 1 had no operation.
Adenocarcinoma or hypernephroma	65	Five are living and well over 5 yr.; 5 lived over 5 yr. and died of metastases.
No report	20	
Total	105	

*All but 1 had a nephrectomy; 1 had a ureterectomy and segmental resection of bladder.

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is living after five years, and recent x-ray examination of the chest and pelvis failed to reveal any metastatic process. Among the 65 patients with an adenocarcinoma or a hypernephroma, 10 lived more than five years, but 5 of these died later of metastases.

Of the entire series, regardless of the type of lesion, 12 patients lived more than five years, and only 7 are now alive and comparatively well. This high mortality was the incentive for further study as to end results.

Every available article listed in the *Index Medicus* and in the *Index Catalogue* of the Library of the Surgeon-General's Office has been reviewed. I pass over the early literature on the subject, including that of Israel, Garceau, Albarran and Imbert, Guillet, Richards, Héresco, Legueu, Denaclara, Chevalier, Hedrén and many others. These articles are very interesting but in a sense disappointing. The operative mortality at the time these men wrote was extremely high. With the increase in our knowledge of operative technic and methods, the operative mortality has definitely decreased. With this decrease one would expect to see a relative increase in the number of ultimate cures. This, however, has not occurred. Berg reported 25 patients with renal cancer, all of whom were dead in seven years. In Paschen's series of 268 collected cases, only 17 per cent were free from recurrence after three years. Pleschner reported 17 per cent cures at the end of three years and 5 per cent at the end of five years. In a series reported by Smith and Shoemaker there were only 7 cases out of 62 that lived over five years; 4 of these died later on from recurrence. Hyman in 42 postoperative cases reported only 9 per cent of five-year cures. Bull recently reported 37 cases of kidney tumor, of which only 5 are free from recurrence — three, thirteen, twelve, eight, and eight years, respectively.

Muir and Goldsmith had 16 per cent cures in 37 cases. Swan showed 20 per cent cures in 51 cases. In the 25 cases reported by Lazarus, there were no five-year cures; however, some patients in this series were operated on recently and may later prove to be cured. Rafin presented 20 cases, 4 of which (20 per cent) went beyond the five-year period. Kimball and Ferris showed that in their series of 74 cases of papillary carcinoma of the kidney there was recurrence in 75 per cent of those who had only a nephrectomy (40 cases), 68 per cent of those who had a nephrectomy and ureterectomy (25 cases), and only 25 per cent in those who had a nephrectomy, a ureterectomy and partial segmental resection of the bladder. Of the 8 cases of papillary carcinoma reported by Scholl, only 2 were free from recurrence; these patients had survived two and a half and four months, respectively. Mock was able to report on 23 of 25 operative cases for papillary carcinoma of the renal pelvis. He traced 18 of these and found that only 5 patients remained well, but he did not state the postoperative duration. In the 45 cases of pelvic papillary tumors reported by Cabot and Allen, only 8 patients lived more than five years. Geschickter and Widenhorn report only 4 five-year cures in 84 cases of cortical tumor of the kidney (hypernephroma and adenocarcinoma); 3 of the 4 patients had metastases. MacKenzie in his series of 27 cases reports only 4 that he believes can be considered as cured, but many of the cases have been operated on recently, and there may well be more cures. Chute was able to report only 5 five-year cures in 43 cases. Wright in his 19 cases of hypernephroma had only 3 five-year cures. In 15 cases reported by Phillips there were no five-year cures. In the 57 cases of squamous-cell carcinoma of the renal pelvis reviewed recently by Gilbert and Macmillan there were no five-year cures. This tabulation of results could be carried on indefinitely to embrace such articles on the subject as those written by Roth and Schwoerer, Thomas and Regnier, Kretchmer, Scholl and Foulds, McCown, Stricker, Lindstrom, Ipsen, Michaëlsson, Ljunggren, Hryntschak, Fedoroff, Key, Nevinny, Cutler, Deuticke, Warner, Carson, Dózsa, Fischer, Demel, Grauhan, Heppner, Lubarsch, Nicolich, Sysak and Jurkewytsch, and Swift-Joly. Suffice it to say that all the reports in the literature show the dreadful mortality of this disease.

I shall not go into the question of Wilms's tumor in children, for the mortality in this type of tumor is well known. The number of cures reported could easily be tabulated on one small page. We are led to believe that certain forms of renal cancer are more curable than others. We all know the terrific mortality of Wilms's tumors and the almost equal mortality of the sessile tumors of the renal pelvis, but we are in the dark as to the actual curability of papillary tumors of the renal pelvis, and especially the cortical tumors, such as hypernephroma and adenocarcinoma. I am sure that the number of cures in the cortical tumors would be further reduced if the reports as we find them in the literature had covered more than five years. There are innumerable reports of recurrence either in the operative scar or by metastasis in patients who have gone beyond the five-year period, particularly in cases with adenocarcinomas or hypernephromas.

Why this tremendous mortality? The answer, I believe, is not difficult. In the first place, inability to make an early pathological diagnosis is the *bête noir* of this disease. We may have been deceiving ourselves in believing that an early clinical diagnosis indicates an early pathological one. Noth-

ing could be farther from the truth. An illustration of this point is the case of a male patient of thirty-eight who entered the hospital with a history of hematuria of three days' duration. He was otherwise perfectly well, and on entry had not an ache or a complaint. He was operated on and a moderate-sized renal adenocarcinoma was removed. The patient was well for four years and

Figure 1. *Small adenoma found at necropsy.*

then developed metastases to the brain and lungs. Although the clinical diagnosis was made early, the pathological process was fairly well advanced.

It is true that renal cancer is diagnosed much earlier now than it was before the introduction of the cystoscope, yet a casual glance through the present-day literature will soon convince any skeptic that the great majority of patients with renal cancer have a fair-sized growth when first seen or operated on. This does not mean that there is an exact relation between the size of the neoplasm and the ultimate prognosis, but it gives some indication of how long the process has gone on. It is fair to assume that the longer the duration of the neoplastic process, the greater the chance for venous and lymphatic extension. The small renal tumors that are found at necropsy as illustrated in Figures 1 and 2 are almost never seen at operation or diagnosed clinically. The reasons are obvious. They rarely give clinical symptoms, and we have no means at our disposal to visualize them by x-ray. It would be the ideal procedure to make a diagnosis before these growths have produced their characteristic deformities of the excretory portion and contour of the kidney, as seen by x-ray. It is precisely at this stage that operative cure could probably be effected in most cases. I say "most cases," for in some instances the lesion may be small and yet the patient may have diffuse metastases. Fortunately this is the exception.

Another factor which prevents early diagnosis and indirectly increases the mortality is the insidious nature of the disease. The number of patients with renal cancers that fall into this group is not small, and they defy the acumen of the best clinicians. They present no urinary signs or symptoms, but are diagnosed clinically when the disease affects other organs. I know of no cancer that can give as little warning as a renal cancer. Creevy in a very excellent paper has recently rediscovered and illustrated this point. These patients may have presenting symptoms such as cough, neurologic ailments or gastrointestinal disturbances. In 9 out of his 38 cases, Creevy found that the patients first sought his advice because of symptoms referable to the lungs, usually in the form of cough, pain in the chest or hemoptysis. We have had cases in our series that are illustrative of this point. One, a woman, fifty years of age, was seen by her doctor for cough of one year's duration. Physical examination revealed a large left kidney, and x-ray examination of her chest showed a metastatic nodule. There was no history of hemoptysis. It is extremely rare, however, to have hemoptysis due to a secondary metastatic nodule in the lung, whereas most of the primary bronchiogenic tumors do produce hemoptysis. This point is worthy of note. Creevy states:

> There is no doubt that a fairly high percentage of the cases of renal neoplasm will continue to escape recognition until late in their course, not merely because patients are prone to delay medical consultation, and because the disease often produces syndromes difficult to identify, but chiefly by reason of the fact that the first symptom to attract the patient's attention is so often due not to the tumor itself but to a metastasis or local extension. This was the case in 33 per cent of the cases in the clinical series, in 50 per cent of those in the autopsy series and in 41 per cent of those in the whole group — a disconcertingly high proportion.

Our series, too, as with other large series in the literature, includes cases in which the diagnosis

Figure 2. *Small adenocarcinoma found at necropsy.*

was made after metastasis had taken place. A child of two and a half years complained of limping of the right leg of two weeks' duration. X-ray of the upper end of the femur showed a lesion, which was interpreted as being either an early tuberculosis, an early osteomyelitis or a beginning

primary tumor. Abdominal examination revealed a fair-sized mass in the right upper quadrant, which at operation proved to be a Wilms's tumor of the kidney. In one case, a man of sixty-seven developed an enlarged supraclavicular lymph node, which on biopsy proved to be metastatic hypernephroma. In another, a woman of sixty-six, a diabetic, complained of "stomach trouble" for three and a half years. Palpation of the abdomen revealed a huge right-upper-quadrant mass, which at operation proved to be a fibrosarcoma of the kidney. In still another, a man of sixty-three entered with a chief complaint of constipation over a period of many months. He had no urinary symptoms but his abdomen was markedly distended. Physical examination revealed an enormous mass occupying the right upper quadrant, and x-ray examination showed metastases to the spine and lungs.

The literature, both past and present, is replete with such case records. Chukry cites the case of a man fifty years old who during defecation felt a sudden numbness of the arms and legs and had a definite left hemiplegia. He had no symptoms referable to the genitourinary tract. At autopsy a renal cancer was found with extensive metastases to the brain, lung, mediastinal glands and myocardium. Johnson cites the case of a Negress, sixty years of age, who had a spastic paralysis of both legs of four days' duration and a microscopic hematuria. Physical examination revealed a huge mass in the right lower quadrant — kidney cancer. Radimska-Jandova and also Barjon and Japiot add similar cases with neurological symptoms. Wodsack included in his 54 cases a number of patients with extensive metastases, but without any urinary symptoms. Metastasic skin nodules (Cochez and Busser, Lubarsch), extreme anemia (de Luna), cough (Harvier and Lemaire), pleurodynia (Shuman) and hoarseness (Turner, Memzel) may be the first symptoms of renal cancer. Simpson cites an interesting case of a boy who was unable to move his leg owing to partial collapse of the first and second lumbar vertebrae. A small renal tumor was removed which on microscopic examination proved to be a spindle-cell sarcoma. The boy died a few weeks later. In his comment Simpson stated: "Such a lamentable result after removal of a tumor, only four days after the first symptom, makes one wonder whether we are justified in telling the public that the cure of cancer is only a question of early diagnosis." I believe that we are justified in so doing provided we keep forever in mind that we seek an early pathological diagnosis and not an early clinical diagnosis.

The third factor that indirectly increases the mortality rate is that we have very few, if any, early symptoms. This is of course true of practically all types of deep cancer. Braasch once pointed out that hypernephromas usually grow slowly, and in their early stages cause few if any, clinical symptoms. The classic triad of hematuria, tumor and pain which are described in every textbook on renal cancer means very little so far as early diagnosis is concerned.

According to Neff, "a patient is lucky whose kidney tumor causes bleeding in the early growth." Hematuria is the one symptom which is so often stressed in the literature. Both the laity and the physician have been told time and again of the necessity for investigation when urinary bleeding is present. In fact, it has not been uncommon in the past to accuse physicians in small communities of not investigating a hematuria and thus making more nearly possible an early diagnosis. I am strongly in favor of investigating every case of bloody urine, but I am not so sure that this will increase the chances of successful diagnosis of early pathologic lesions, especially of cortical tumors. We must remember that in order to have hematuria from a cortical tumor the lesion must extend into the renal pelvis or its appendages, or, as shown by Patch and Rhea, produce bleeding by congestion of the subepithelial spaces. In our series the urinary sediment was negative in a fair percentage of cases. By this is meant that no erythrocytes could be found in the urines of these patients when they entered the hospital. This does not necessarily signify that they had not had hematuria at some other time, but simply that when they were first seen no red cells were found in their urines, nor did they give a history of hematuria.

Gross hematuria was present in only a small group of cases. This is very significant. It may be that in this particular series the incidence of hematuria was low, but in the literature, report after report can be found where a fair percentage of the cases did not have macroscopic bleeding. In view of this last statement, how can anyone make an early diagnosis in these cases? The fact is that we do not make it; in a number of our cases the growth was of fair size and the patient had only recently complained of hematuria. Quite a number presented hematuria as the initial symptom, yet on physical examination a large tumor mass was present. Nearly all these cases were in the parenchymatous group.

This shows strikingly that the symptom — mass or tumor — was not sufficient in itself to bring the patient to the doctor, but that the addition of hematuria was. Hematuria, although a fortuitous sign, as stated by Neff, does not necessarily mean an early tumor even though it is a presenting symptom and of quite recent date. The patient who had one of the largest tumors in this series had his first hematuria three days before death.

In Wilms's tumors in children, hematuria is not a very early symptom. Prather and Crabtree found it in only 15 per cent in their group of 111 cases. In Mixter's series of 41 cases and in Schippers's cases, hematuria was present in 2 per cent and 10 per cent, respectively.

The value of tumor as a sign in the early diagnosis of kidney cancer is likewise small. Patients as a rule do not continually examine their abdomens for tumor, and the chances are that when a mass is palpated the lesion has gone on for a considerable time. The growth has probably extended beyond the capsule or into the venous system. There are obviously exceptions to this rule, but in the main it must be conceded that the very finding of a tumor mass militates against an early lesion. It may be an early diagnosis so far as the physician is concerned, but it is not an early pathologic process. This is well illustrated in the Wilms's tumors found in children. We all know that the chief complaint in this type of tumor is an increasing swelling of the abdomen due to a large mass. We know also the dreadful prognosis in these cases. The number of reported cures in the past thirty years can be counted on two hands and the total number is probably not greater than twice those reported. This is an appalling fact.

Pain as an early symptom I believe to be of extremely doubtful value. It is the chief complaint in most cases of epithelioma of the renal pelvis. As it is a subjective symptom, it depends entirely on the individual's threshold for pain. Persons with a slight degree of pain usually carry on for a long time before they consult a doctor. Invariably they hope that the pain will pass off, and attribute it to some other cause. Fortunately most pain does pass off and no cancer develops, but only when the pain is severe or hinders his daily work will the patient consult a physician. Imagine every woman's going to a physician because her back hurts! I am not sure that the average physician would welcome such a practice. The symptom itself is so indefinite that it is of value in the diagnosis of renal cancer only when associated with hematuria. Of course, many times pain is due to a large tumor.

The fourth factor that tends to increase the ultimate morbidity is failure to do a radical operation when circumstances permit. A radical disease such as this requires radical treatment. Just how much this would increase the percentage of operative cures above the 10 to 25 per cent recorded in the literature is doubtful. It might, however, reduce the number of postoperative recurrences. The term "radical" is of necessity all-inclusive. There are some procedures that can be easily accomplished, and others that are not so easy.

Removal of all the perirenal fat can and should always be done. A large percentage of parenchymatous tumors when operated upon already extend beyond the true anatomic capsule into the perirenal fat. Statistics on this point are hazy, but this percentage may well be far greater than we suppose. In this series, extension beyond the renal capsule was present in a large percentage of cases.

The advisability of doing a nephroureterectomy, with or without a segmental resection of the bladder, in papillary tumors of the renal pelvis is unquestionable, but it is not always feasible, nor is it advocated by all urologists. Nicolich feels that in most cases of tumor of the renal pelvis, whether of benign or malignant histologic structure, a nephroureterectomy should be done. However, since this radical procedure increases the operative risk, it should be done only when the general condition of the patient allows it. In old and weak patients one should do a simple nephrectomy, as a permanent cure is often possible. The nephroureterectomy may be done in one stage or in two (Smith and Gilbert).

It is true that not all cases of papillary tumor of the renal pelvis give transplants to the ureter and bladder, but it is equally true that no one can say offhand which papillary tumor will give rise to transplants and which will not. It is striking to see the percentage of recurrences of this tumor and the number of deaths definitely attributed to it, notwithstanding that clinically it is usually diagnosed early and that pathologically the growth is usually of low malignancy. Stricker in 175 cases of papillomatous tumor of the renal pelvis found transplants to the ureter and bladder in 47 per cent. In the cases where nephrectomy alone was done, 35 per cent had recurrence in the bladder or ureter. Kimball and Ferris reported 74 cases found in the literature, in 50 of which the tumors recurred in the ureter and bladder following nephrectomy. In 24 cases of their series, the ureter or bladder was affected at the time of examination or operation. Cabot and Allen report 33 cases of papillary tumor; in 20 cases (44 per cent) it was localized to the pelvis, and in 13 cases (29 per cent) the ureter and bladder had implants.

The benignity of the tumor is not necessarily a guarantee of cure (Smith and Gilbert), for not infrequently malignant metastases from such tumors have been found. The transplants may become evident at an early or late period following nephrectomy; this naturally necessitates keeping the patient under strict surveillance. Asch removed a small papilloma of the renal pelvis which was followed in two months by a secondary deposit in the bladder about 7 cm. in diameter. The blad-

der was resected and six weeks later the patient died. Extension to the scar was found. Zuckerkandl reports a case where six months following nephrectomy twenty tumors from 1 to 2 cm. in diameter were found in the bladder. The bladder was negative at the first examination. Nitch had to do a total cystectomy owing to extensive papillomatosis of the bladder and ureter following removal of a papillary tumor of the renal pelvis. Necker cites a case in which subsequent to a nephrectomy the bladder became filled with papillomatous masses, whereas six months before it had been free of growth.

Two cases in our series are typical examples. One was that of a man of fifty-one who entered complaining of hematuria of eighteen months' duration; a diagnosis of papillary tumor of the renal pelvis was made. A nephroureterectomy was decided upon, but only a nephrectomy and partial ureterectomy was done, owing to the patient's condition on the operating table. He had an uneventful convalescence. A ureterogram and cystoscopy at the time of operation were negative. Fourteen months later the patient returned with a small tumor at the ureterovesical orifice. A complete ureterectomy and segmental resection was done, and up to the present time (five years) there are no demonstrable vesical recurrences. In the second case transplants appeared promptly. A nephrectomy was done for papillary carcinoma of the renal pelvis, and at the same operation part of the ureter was removed. At operation a cystoscopy and a ureterogram were negative. Four months postoperatively cystoscopy revealed a large tumor mass obstructing the ureteral orifice on the same side as the tumor. A ureterectomy and partial segmental resection of the bladder were done; the ureter was filled with small papillary implants. These two cases can be duplicated in any large series in the literature. They simply go to prove that it is impossible to tell before operation, even with a negative ureterogram and nothing at cystoscopy, whether very small transplants are present in the ureter or will be present in the bladder at a later date.

Other radical procedures, such as removal of solitary metastases when found in bone and deliberate opening of the vena cava to remove tumor plugs, have been advocated. The number of patients who fall into these two groups is indeed small; hence radical procedure of this sort would do little to raise the number of cures. Berg in 1913 called attention to the fact that "the metastases of hypernephroma are very often single," and added that "whereas with other varieties of malignant tumor one would decline to remove either the primary or secondary tumor because the metastatic foci of disease are apt to be multiple, yet in this variety of growth we would be justified in extirpating both the primary tumor and the secondary deposit."

It is not a simple problem to say when a metastatic nodule is a solitary one and when it is not, but I believe one is justified in assuming that it is if a thorough x-ray examination of the rest of the bony skeleton and lungs is negative. Some of these cases of course have metastases in deep viscera not visualized by x-ray. That single osseous metastases do occur is proved by autopsy material. Lehmann collected in the literature 56 cases of bony metastasis from carcinoma of the kidney and found that in 13 of them the lesion was a solitary one. Five of these 13 were proved by necropsy, and in 8 the clinical examination revealed no secondary deposits. Hartmann cited a case of a man with a renal neoplasm and metastases to the humerus. The patient refused operation and later died. At necropsy no other metastatic nodule was found. Schinz and Uehlinger report solitary osseous metastases in 6 of their 34 cases. Smith and Shoemaker add the case of a male patient on whom a shoulder-girdle amputation was done, who had only a solitary lesion in the humerus. He refused a nephrectomy and died five years later. At the time of operation the lesion in the humerus was the only skeletal one present. Albrecht cites a case in which amputation was done for a supposed osteosarcoma; it proved to be a metastatic hypernephroma. The patient lived for five years, and at necropsy no other metastases were found. Many other cases of solitary bone metastases may be mentioned (Tixier, Bland-Sutton, Colmers, Geschickter, Broster, McKechnie, Bull, Pleschner), but considering the total number of reported cases of kidney cancer, they constitute a very small percentage of the whole.

Recently at this hospital, Dr. Churchill removed a pulmonary metastasis arising from a carcinoma of the kidney. So far as known, this is the first case of a successful lobectomy for such a purpose. The patient, a woman of about fifty, consulted a physician because of a persistent cough. X-ray of the chest revealed a metastatic nodule about 4 cm. in diameter. Abdominal palpation showed the presence of a tumor mass in the right upper quadrant. X-ray photographs of every bone in the body revealed no bony metastases. I helped Dr. Barney remove the kidney. At operation there was no evidence of extension to the renal vein or vena cava. The perirenal tissue was not invaded by the neoplasm. Following the operation the chest was irradiated, without effect. Another series of deep roentgen treatments of the chest did little to decrease the size of the metastatic focus. Six months

after nephrectomy Dr. Churchill did a lobectomy; four years have passed since then, and the patient is now in good health and to the best of our knowledge free of metastases. This case is cited as an incentive to others to remove solitary metastases.

Whether one should open the vena cava and remove the tumor plugs we cannot state, owing to lack of experience. In not a single case in this series was this done. That it is technically possible has been proved beyond question (Mayo), but whether the procedure decreases morbidity to a marked extent is doubtful. It is a fact that there are recorded in the literature many cases in which at nephrectomy tumor plugs filled the renal vein and vena cava, and yet the patients lived for years. Ljunggren cites a nephrectomy case in which at operation tumor tissue was noted in the renal vein and vena cava. Ljunggren examined the thrombus in that portion of the renal vein removed with the tumor and found that it consisted of hypernephromatous tissue. The patient lived for ten years and then died of metastases.

Allemann and Bayer, Judd and Hand, and Smith and Shoemaker record similar instances. The case cited by Smith and Shoemaker is interesting. The patient had a nephrectomy done for hypernephroma in 1913. At operation extensions to the spermatic and renal veins were noted. The patient lived for ten years and died of "cardiorenal disease." It has often been shown at necropsy that although the renal vein and vena cava were occluded with tumor, no signs of metastasis could be found (Rehn). This is a valid argument in favor of deliberate opening of the vena cava in some cases, but one should not forget that it may be extremely difficult to ascertain at operation just how much tumor thrombosis of the vena cava exists. The tumor plugs may extend to the right auricle (Quinland, Pleasants, Crowdy, Fraser, Jacobson and Goodpasture, Israel, Hinman, Albarran and Imbert, Osler, Lebert, Coyne and Troisier, Polayes and Taft, Carson, Oberndorfer and Ribbert, MacCallum, Taylor, Foster and Gerhard, Gayet and Bériel), or down to the bifurcation of the iliacs (Crowdy, Jacobson and Goodpasture). This most radical procedure necessitates a transperitoneal approach, one which is advocated by all competent urologists for parenchymatous tumors of the kidney and which allows a greater exposure of the operative field than is possible with a conservative operation. There are, however, many renal tumors that can be easily removed by the usual retroperitoneal approach.

The value of deep x-ray therapy in the treatment of renal cancer is at present doubtful. From the maze of literature on the subject a few facts have been brought to light. They should be kept constantly in mind in applying this form of therapy to such pathologic processes. So far as I am aware, no patient with a renal neoplasm, regardless of the histopathology, has been cured with deep roentgen-ray treatment alone. This has been enunciated by Mixter, Wharton, Harrah, Portmann, Dean and Pack, Priestley and Broders, Waters, Pohle and Ritchie, Prather and Crabtree and Schippers et al. In the 12 cases of Wilms's tumor reported by Priestley and Broders and in the 3 cases (malignant cystadenomas) reported by Geschickter and Widenhorn, in which irradiation alone was used, all the patients died. Perhaps when the roentgenologist is able to deliver a dose to the tumor at a greater depth without too much harm to the neighboring structures and too great a systemic effect, or, as Dean and Pack imply, when there is better equipment, a new era in its application will open. Until then no curative effect should be expected from irradiation alone. Preoperative irradiation of renal cancer has recently been extolled by many prominent urologists and roentgenologists. Its chief purpose is to shrink any large new growth, mainly Wilms's tumors and adenocarcinomas, so that an inoperable neoplasm can be made operable and be entirely removed. It has been demonstrated that after preoperative irradiation the extirpated tumors show, microscopically, strands and nests of vital tumor cells surrounded by areas of fibrosis of more or less density (Randall, Wharton, Dean and Pack). Necrosis of the tumor, varying with the amount of irradiation, takes place.

Wharton feels that failure to cure malignant tumors of the kidney is due to inability to remove completely the local growth. This inability he ascribes to a number of conditions: the pronounced size of the tumor, the thinness of the capsule, the extreme vascularity and friability of the mass, invasion of the perirenal structures and the extension into the renal vein. "The one factor," he continues, "which has been responsible for more operative deaths than all the others combined, the size of the tumor, has remained beyond control until the present time." There is no question that deep roentgen-ray treatment decreases the size of a renal neoplasm. It is extremely efficacious in Wilms's tumors, moderately so in adenocarcinomas and hypernephromas, and almost nil in tumors arising from the renal pelvis. As Wharton states, "the effect that preoperative irradiation has on the chance of ultimate cure cannot be reported, as this can only be determined with the passing years." Since Wharton's article, enough cases having preoperative irradiation for Wilms's tumor have been reported to give the clinicians some idea of what may be expected. It has not so far been successful as a curative agent when used in conjunction with late operative removal

of the tumor, but the fact that it is still in its infancy is no bar to its continuance.

Postoperative irradiation of the local area after nephrectomy is of questionable value. It is usually carried out in all clinics in cases where the tumor mass has not been completely removed, and in some clinics as a routine measure. All authors are not in accord as to whether postoperative irradiation should be given where a thorough removal of both the growth and the fatty contents of the renal fossa has been effected. Exactly how helpful it is as a curative or retardive measure in any single case is hard to judge. Whether some operated cases have been cured by this adjunct is extremely difficult to ascertain. I believe this form of therapy to be of very little value in cases where a thorough job of removal has been done. Delayed postoperative irradiation is usually confined to cases where recurrence has taken place in the kidney bed, in the scar or at distant points. Once there has been recurrence in the renal fossa, regardless of the pathological type of tumor, little can be expected from irradiation except a slight decrease in the size of the mass. It often happens that the recurrence is less radiosensitive than the original tumor, so that subsequent irradiation is not beneficial. A recurrence of a tumor nodule frequently takes place in the old nephrectomy scar, even years after the nephrectomy. Tikhoff cites an elapsed period of ten years; Bland-Sutton, eleven; Smith, seven; Graves and Mabrey, twenty; Bull, seventeen; Quinby, nine; Michaëlsson, ten; and Muir and Goldsmith, fifteen. Irradiation here may be of some aid, but most urologists hold that the secondary deposit should, if possible, be removed surgically. Interstitial irradiation is sometimes useful for this type of recurrence provided the metastatic nodule is small.

It may not be amiss at the present time to state that our ideas about the value of x-ray therapy as an adjunct in the cure of renal cancer may change overnight, so to speak, with the newer developments in technic, dosage and high-voltage treatment.

From the maze of statistics of which this communication is a very minor part, I have formed a definite opinion as to why the percentage of five-year cures in this disease is so small. Although failure to do radical surgery in suitable cases is an element in reducing the number of late cures, the very nature of the disease is by far the largest single factor making for a high mortality. It is obvious that we see proportionately few cases of early pathologic lesions. We may see them early clinically, but pathologically they have probably either invaded the venous system or extended beyond the confines of the renal parenchyma. Unquestionably the end results would be much better in patients with renal cancer if they were treated soon after their first hematuria. Only persistent education of the laity as to the significance of urinary bleeding will add to the longevity in this group. But how about those who have had no hematuria, and whose first sign of renal cancer is to be found outside the urinary tract? This group is not by any means small, and its members are the victims of the well-known insidiousness of renal cancer. Their situation is analogous to that of patients with cancer in other deeply situated organs. The results will be greatly improved when the diagnosis can be made in this asymptomatic period while the growth is still limited to the kidney. Until that time we should not expect the impossible.

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DOCTORS AND BOOKS

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BOSTON

IT IS an honor to be asked to address you on the occasion of the inauguration of the Gerrish Memorial Library and Lectureship. We live in a land and in a time of opportunities that we appreciate all too little. I would begin, therefore, with a note of gratitude and a hope that we may deserve and cherish the privileges accorded to the medical profession in our country.

To speak of the value of a medical library is trite indeed, for everyone is aware of it. Many are familiar with Osler's saying in 1901 that "to study the phenomena of disease without books is to sail an uncharted sea." Oliver Wendell Holmes in his dedicatory address at the opening of the Boston Medical Library in 1878 said: "A physician of common sense without erudition is better than a learned one without common sense, but the thorough master of his profession must have learning added to his natural gifts." And Harvey Cushing in 1926 wrote: "As the calorimeter tells the activity of the patient's metabolism, so may you determine the plus or minus activity of the local profession in any district by the condition of its library." But there are still other things about doctors and books that are, I believe, worth saying. It is of some of these that I shall speak.

The first half of my address will be concerned with the importance of the record of ideas and facts, with the unimportance of priority and with the interesting subject of rediscovery.

Those who read medical books or journals often appreciate that what they read is what has been in their own thoughts in whole or in part for a long time, as the result of reflection, experience or research. They may react with pleasure that others agree with them, or with envy that they themselves had not had the time or inclination or industry to do the writing first, or with annoyance because of what they believe to be errors or omissions. Actually it is vain and idle to boast or to quarrel about priority. Always men have lived in periods where others besides themselves have been at work on the same problem, no matter how unusual or bizarre. I myself remember being surprised some years ago, when I was dissecting a whale's heart, on being told that someone in Norway was doing the same thing at that very time.

The larger and more important the problem, the greater as a rule is the number of students of that problem. Many contributions may be made toward its solution by many different individuals; sometimes the same discoveries may be made simultaneously and entirely independently by different workers. Then, when the pieces of the puzzle are almost assembled, some inspiration or clue may suddenly complete the picture, and the lucky person may receive more than his due of credit. After all, it may be that the first step in the analysis of the problem, often lost in history, was more vital than the last. Every contributor deserves credit, and the more we learn of medical history the more we find this to be true; new or forgotten names take rank with those that have long been well known — for example, the Flemish artist van Calcar, pupil of Titian, who drew the splendid anatomical pictures for Vesalius. Even the great Harvey but finished the masterpiece of the discovery of the circulation of the blood which had long been building; he himself studied in northern Italy under the anatomists who had learned from their forerunners and their own observations that the heart was a pump sending blood from the right ventricle through the lungs to the left ventricle, receiving thereby a vital spirit which the left ventricle passed on to the tissues of the body; that the blood in the veins carried nutriment back to the heart; that there were doubtless capillaries — too small to see — connecting arteries with veins; and that the veins contained valves. Harvey noted that the valves in the veins were so constructed that they prevented (not simply retarded) the retrograde flow of blood through the veins. This was the clue that he seized upon; by simple, clear experiments he demonstrated that the blood must flow from left to right ventricle through the systemic arteries and veins to complete the circuit already in part understood in the pulmonary circulation. But even he could not complete the picture. He too assumed that there must be capillaries, but it remained for Malpighi several decades later to discover them.

I have presented this instance because Harvey's discovery is generally regarded as the highest landmark in the development of our knowledge of medical science. Yet it is clear that great as was his work, it was but one contribution among many in the same field; had not Harvey made the dis-

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covery, it is well-nigh certain that someone else would have made it within a relatively few years, for the time was ripe. Roesler, formerly of Vienna and now of Philadelphia, has recently most aptly quoted Sir Michael Foster:

> To whom shall be given the honor of a discovery? This question can never be answered fully; science is a continuous process, each investigator must of necessity build on the work of those who come before him. What we know and what we think is a stream which flows by us and through us, fed by the far-off rivulets of long ago.

Harvey himself in 1628, in Chapter I of the *De Motu Cordis,* in speaking of this very subject quoted the old man in the comedy *Adelphi* by Terence:

> For never yet hath anyone attained
> To such perfection, but that time, and place,
> And use, have brought addition to his knowledge;
> Or made correction, or admonished him,
> That he was ignorant of much which he
> Had thought he knew; or led him to reject
> What he had once esteemed of highest price.

Incidentally it is of interest that the priority of the announcement of knowledge of the pulmonary circulation in the century before Harvey is still in doubt, an academic point and yet one historically intriguing. Realdus Columbus, professor of anatomy in Northern Italy, published his *De Re Anatomica* in 1559, and in that volume is the description of the pulmonary circulation. Six years earlier, however, the circulation of blood through the lungs was referred to incidentally in the religious tract *Restitutio Christianismi* by Servetus, who was that same year burned at the stake for his religious views. And much earlier still, in the thirteenth century, the theory of pulmonary circulation was advanced quite clearly by Ibn-an-Nafis (Haddad and Khairallah*). It may be that still earlier mention was made in manuscripts now lost. It was a time, of course, when verbal instruction and knowledge was the rule because of the expense and difficulty of writing and of printing. It is probable that Columbus and others had taught the pulmonary circulation for years before the appearance of *De Re Anatomica.* As it stands now, however, Ibn-an-Nafis holds the priority of announcement.

One other example I would cite in emphasizing this point, an example nearer home and in our own times. In 1914 Dr. Richard C. Cabot wrote an important paper on the causes of heart disease, a landmark in the study of diseases of the circulation. It was simple and clear, as are most significant contributions in medical science. He did not think it was a masterpiece or that he was the only man in the world with such thoughts, but he recognized that many workers and writers in medicine were not aware of the importance of these findings. And so he wrote them down. A few days ago one of Cabot's contemporaries told me that what he wrote in 1914 was common knowledge at the time, and implied that little credit should be given to the contribution. It is true that others had the same ideas, but they did not realize that thoughts in order to live, or even to travel far from their immediate neighborhood, must be recorded.

That is the first important message of my talk to you today. It is, in sum, that if a doctor has learned something from his experience in practice or in research that is not clearly or widely known, and is not recorded in print at all or as he believes it should be, it is his duty to write briefly and clearly his findings. Such a duty may become a pleasure, but it goes without saying that the doctor must make sure, first, of the truth of his conclusions, secondly, of their importance, and thirdly, that they are not already on record. Thus any of us may be writers of books or articles as well as readers of books, if we keep our eyes open, and have enough curiosity and opportunities, judgment and persistence. We certainly have more than enough so-called medical literature now, but there is still plenty of room for worth-while books and articles.

The next message I would give you naturally evolves from the first. Do not fill your library full of modern books and journals: leave plenty of space and money for the more important books of the past, dating back if possible to the time of the first printing presses. It is not essential that you shall have any priceless incunabula, that is, books printed before 1500, but it is important that you secure some representative volumes of the sixteenth, seventeenth, eighteenth and nineteenth centuries, even though a considerable proportion of them will be in Latin, German, French or Italian. There is always someone in every community who can help you in the translation of these languages when you are looking up some special points of interest. A classic or a leading textbook of the past is far more valuable than a second-rate volume of the present, in a practical sense as well as from the standpoint of the book-collector. Although many important medical books and articles are being published today, much of the enormous mass of writing is not worth the paper it is written on. Only a small percentage of books and journals is necessary to have close at hand for ready reference; it is always possible to go or to send to Washington or New York or Boston or elsewhere for the rarer or less important works. The committee that will have the selection of your books must be very wise; its judgment will be more important than the size of the budget for the purchase of books.

*Haddad, S. I., and Khairallah, A. A.: Forgotten chapter in history of circulation of blood. Ann. Surg. **104**:1-8, 1936.

We must be constantly on the watch for the announcements and descriptions of new discoveries and advances in the active medical progress of today, but we must also have a thought for the rediscoveries. The rediscovery of a fact or truth or the restatement of an important theory or teaching is almost as significant as its original presentation, but it is much more satisfying and less humiliating for the rediscoverer to know by careful historical research that he is a rediscoverer than for him to assume at the start that he is the originator. Medical history is full of rediscoveries. It may interest you if I cite but a few that have come in my own particular field, namely that of cardiovascular disease.

Lancisi, physician to Pope Clement XI at the beginning of the eighteenth century, described the engorgement and pulsation of the jugular veins that accompany enlargement and failure of the right ventricle; in fact, this phenomenon was for many years known as Lancisi's sign. It appears to have then been forgotten; two hundred years later it was rediscovered by James Mackenzie and his pupils, who apparently knew little or nothing of Lancisi's observations.

In 1832 Hope in England described clearly the congestion of the blood vessels of the lungs, along with the consequent dyspnea that results from failure of the left ventricle. This vital phenomenon was later almost completely neglected in English medical writings, and was even denied by Mackenzie and his school. It has now been rediscovered by writers of the English language, although one conversant with and sympathetic to French and German medical writings, at least in the last generation, would not have fallen into this error.

In 1715 Vieussens of Montpellier described the pulmonary stasis that results from the mechanical effect of mitral stenosis. Yet even in our own day there are many who fail to recognize this, and who do not realize that the dyspnea in uncomplicated marked mitral stenosis, whether in paroxysmal form with or without cardiac asthma, or in chronic form as the result of effort, excitement or infection, is not due to failure of either the left ventricle or the right, but to the overloading of the already congested pulmonary blood vessels by the increased rate of the over-strong right ventricle.

In 1749 Senac, physician to the French Court, wrote that he had often found quinine helpful in cases of rebellious palpitation. In 1914 Wenckebach reported that a patient of his had rediscovered this interesting fact. Now, in the form of quinidine, cinchona bark is frequently used in patients with paroxysmal tachycardia, auricular fibrillation and premature beats.

In 1785 Withering wrote that powdered digitalis leaves should be administered at the outset in the dose of from one to three grains twice a day, bearing in mind that thirty grains may be taken before nausea begins. In our own generation we rediscovered this optimal dosage. We knew, of course, that Withering had introduced the foxglove for dropsy, but most of us did not read far enough along in his remarkable book to get to the page where he gave advice as to the exact dose.

Bonetus, who as far back as 1679, compiled huge volumes of autopsy case reports, arranged according to symptoms from the top of the head to the soles of the feet, was one of the early forerunners of Cabot in differential-diagnosis case teaching. In these volumes, still largely untranslated, many interesting conditions can be read about, such as sudden death in a robust middle-aged man with aortic stenosis, a phenomenon that has again in recent years aroused special interest. Morgagni nearly a century later did of course present again many of the cases cited in the *Sepulchretum* of Bonetus, with valuable commentaries on their pathological significance, but there are still gems in this mine that may be rediscovered.

Osler, in the original edition of his *Practice of Medicine* of forty-five years ago, pronounced some views that we now think are rather newly held. For example, under rheumatic fever he writes that chorea is more apt to develop in the relatively slight rheumatic attacks of childhood; that rheumatic nodules may be regarded as a positive indication of rheumatism and have been noted particularly in severe and chronic rheumatic endocarditis; and that "medicines have little or no control over the duration or course of the disease, which like other self-limited affections practically takes its own time to disappear. Salicyl compounds, which were regarded so long as specific in the disease, are now known to act chiefly by relieving pain. . . . Nor do they prevent the occurrence of cardiac complications."

And so it goes. The more one reads the better medical works of past generations, the more astonished one becomes, and the more humble, too, at what has been known and written and then forgotten. Progress has, after all, been very gradual with its ups and downs, though latterly much accelerated by the energetic activity of many workers. Yet in our zeal and enthusiasm at the present day we must not overlook the work and the ideas of our predecessors. We may perhaps rightly overthrow some of the teachings of our own teachers, only to find that their teachers in turn had believed some of the things that we believe today, perhaps

in such exaggerated measure that their pupils, who were our own teachers, discovered their error and then swung too far in the opposite direction.

Anyone who finds it difficult to think of new problems to puzzle over need only review some of those mentioned in former days and then forgotten. Indeed, if he goes back in the literature two or three generations he may come across some clever notion or suggestion to follow up or, if he is unprincipled enough, to assume as his own. The great Corvisart, physician to Napoleon, in the preface to his translation of Auenbrugger in 1808 said that for all the current medical world knew of Auenbrúgger's important discovery of the use of percussion in clinical diagnosis forty-seven years earlier, he (Corvisart) could easily have announced it as his own.

Oliver Wendell Holmes, in his address in 1878, referred to the need of a collection of the works of the old masters for every medical library. "Men were not all cowards before Agamemnon," he remarked, "or all fools before the days of Virchow and Billroth." He added:

> It does please me to read the first descriptions of parts to which the names of their discoverers or those who have first described them have become so joined that not even modern science can part them; to listen to the talk of my old volume as Willis describes his circle and Fallopius his aqueduct. . . . We need in this country not only the scholar but the *virtuoso,* who hoards the treasures which he loves.

To hammer this thought home I conclude this first part of my address with two brief quotations from Osler's 1901 address at the dedication of the new building of the Boston Medical Library:

> There is a third class of men in the profession to whom books are dearer than to teachers or practitioners — a small, a silent band, but in reality the leaven of the whole lump. The profane call them bibliomaniacs. . . .
>
> I should like to see in each library a select company of the Immortals set apart for special adoration.

Finally, as Lowell remarks,

> 'Tis man's worst deed
> To let the things that have been run to waste
> And in the unmeaning Present sink the Past.

* * *

The latter part of my address has to do with a subject of equal interest to that covered by the first. It concerns medicine as literature and literature as medicine.

It is indeed a pity that this golden age of medicine does not coincide with the golden age of literature. Many important facts and ideas are buried, or at least in part concealed, by verbose or clumsy or otherwise inferior writing. In this matter the early education and environment of the doctor are often at fault. Not only has much of the fundamental cultural training of the youth been neglected, but even the rudiments of penmanship, spelling, grammar and literary style are often too hastily covered to establish good habits in the student of the present generation. It has become almost a commonplace that the average doctor writes illegibly, spells atrociously, constructs barbaric sentences and paragraphs and has an uncouth literary style. Since it is impossible to tell in childhood who will be the writers of medicine in the next generation, it would be wise to require of applicants for admission to the medical schools in the future a truly classical as well as a scientific fundamental education. The inclusion of Greek and Latin in language and literature, French and German, English in all its aspects, and history and archaeology in the pre-medical curriculum might easily make the difference between enjoyment and profit on the one hand and disappointment and neglect on the other, both in the reading and in the writing of important medical scientific papers and treatises. More and more we shall realize the truth of this, and shall strive to emerge from the barbarism of the medical literature of today to a higher level.

As I have already indicated, this situation has a practical as well as an esthetic bearing upon medicine. What is well written is much more likely to be read and believed than what is clumsily or drily written. Many untruths and exaggerations in medical or other sciences have been so attractively presented in writing that they have been widely read and have vied with pure fiction among the best-sellers, while many facts and theories of the greatest importance are still buried in verbose, dull or unintelligible language in book or journal. Now and then there shines forth an exception in which a valuable discovery or thought is couched in such excellent style that it attracts early and lasting attention. These gems in books or reprints you should zealously seek and jealously save, no matter how ancient or modern, how long or brief, or in what language.

A few of the literary treasures in medicine are the *De Medicina* of Celsus of Rome — a finer piece of concise writing than the books of Galen which followed; the medical translations of Linacre; the *De Motu Cordis* of William Harvey, a clear, forceful and entertaining treatise as well as the announcement of a great discovery; the *De Aneurysmatibus* of Lancisi, physician of that very intelligent pope, Clement XI, one hundred years later; the *Opera* of Sydenham of 1666; the volumes on heart disease by Senac and Corvisart, physicians of the French Court in 1749 and 1806 respectively; the *De Sedibus et Causis Morborum* of Morgagni in 1761; the writings of Heberden and Withering at the end of the eighteenth century; the notable treatise on the heart by James Hope of London in 1832; Trousseau's *Lectures* of 1861;

Osler's *Practice of Medicine* of 1892; and Cushing's *Life of Osler*, published in 1925.

A classical education, spurned by many of the scientists and professional workers of today, has other values than those of the writing of better books and of pleasure in their reading; it adds enormously to the enjoyment of life and to its richness with the passing of the years. Even Greek, which is now so little studied, not only eases the lot of the first-year medical student as he memorizes many new anatomical names, but affords a foundation of the study of the history of medicine which has a practical as well as an esthetic value. It also greatly increases the enjoyment and profit of a visit to the medical shrines of Greece, which I myself most heartily recommend to any physician, young or old.

There remains the neglected topic of literature as medicine. We are all conscious of the possible importance of this method of psychotherapy, but we apply it very little, allowing our patients to read an enormous amount of absolute trash. Some reading matter of this description may be permitted on the basis of its soporific or distracting quality, but most of it were better consigned to the fire and replaced by something really worth while which can continue to be enjoyed through a lifetime. The text of Dr. Gerald Webb's delightful address delivered before the Association of American Physicians in 1930 is one of the very few writings on this interesting subject.

I advise you to reserve a shelf or two of your library for books which have an outstanding value in convalescent care and in the treatment of nervous prostration, mental depression, chronic invalidism and incurable disease. I do not refer so much to books especially written for patients as to classical literature that delights the mind, absorbs the attention, and cheers the spirit of the healthy as well as that of the sick. What books are especially adapted for this? Which ones may lead the patient to new interests as well as to help him to pass the time enjoyably?* In our own New England flowering of one hundred years ago there were two authors whose books belong here: Thoreau and Emerson. There are also Holmes's *Breakfast Table* series and the works of Mark Twain. For the beginning of convalescence there may be read snatches from Burns or Kipling. Soon after, the mind may be completely transported by James Hilton's most delightful story *The Lost Horizon, John Brown's Body* by Stephen Vincent Benét, or *Memoirs of a Midget* by Walter de la Mare. Still later, the novels of Conrad, Dickens, Victor Hugo or Charles Reade, Chesterton's "Father Brown" or Doyle's Sherlock Holmes series may be prescribed with telling effect; not to mention such biographies as Strachey's *Queen Victoria* and *Eminent Victorians*, the essays of Lamb and Irving and the poetry of Coleridge, Wordsworth, Shelley and Keats. For more robust minds, at the end of convalescence or in chronic illness, Ortega's *The Revolt of the Masses*, Gibbon's *Decline and Fall of the Roman Empire*, Prescott's *Conquest of Mexico*, Galsworthy's *Forsyte Saga, South Wind* by Norman Douglas, and the works of Browning and Shakespeare; for young persons Stevenson and *Robinson Crusoe*, Mark Twain, *Alice in Wonderland* and *Dr. Dolittle's Voyages*. Always one must judge the strength, mental age and interests of his patients. Some of these will do well in late convalescence or chronic illness to indulge in essays and articles dealing with fundamental aspects of the arts and sciences, but it is well not to force such books too soon.

I refer you especially to four passages of sound literature as examples of what may be used to entertain, divert and instruct the mind during convalescence or chronic illness. The first two, by writers of the past, are three paragraphs from Emerson's essay on Shakespeare, written in 1850, beginning "Great men are more distinguished by range and extent than by originality," "So it fares with the wise Shakespeare and his book of life," and "Shakespeare is as much out of the category of eminent authors as he is out of the crowd," and the first few pages of Shakespeare's *Julius Caesar*. The latter two, by authors of our own generation, are the first four stanzas of Benét's *John Brown's Body*, and a bit from T. E. Lawrence's *The Seven Pillars of Wisdom*, at about the middle of the book, describing the comments of Nasir, Mohammed, Zaal and Auda on the stars.

Let the doctor eventually pick out a "five-foot shelf" of books for therapeutic use, and read them himself. To do so will add to the pleasure of his life, the cultivation of his mind, the easing of strain and the effectiveness of his treatment — goals which are infinitely worth while, even though the patients themselves do not receive the books until they have become shopworn at the doctor's bedside.

Finally, in this collection of literary medicine set aside for professional interest there should be a special group consisting of the worth-while books that doctors themselves have written: the romances of Gargantua and Pantagruel by Rabelais, the writings of Oliver Goldsmith and Thomas Browne, the works of Oliver Wendell Holmes and S. Weir Mitchell, the detective stories of

*I have not included among the works cited below certain passages from the Bible despite their important place in literature and beauty of thought; for those already familiar with the Scriptures, however, and for others needing spiritual consolation there are many passages from both Old and New Testaments that may be recommended, particularly from the Psalms and from Christ's sermons.

Conan Doyle, and the essays of Osler, Cabot and Cushing.

The patient's reading must not be forced. The first rule is that it be for pleasure, and the physician can even profitably express to his patient his envy of the leisurely opportunity for reading that will come in convalescence or in prolonged illness — an opportunity that some over-busy physicians secretly look forward to, if only they may select their own illnesses!

And now, in closing, I wish long life and great usefulness to the Gerrish Memorial Library in its service to the doctors in Maine. May its books and journals play their part in keeping the medical profession in this State abreast of the times. May the library help in bringing solace and pleasure to both patients and doctors, and even kindle some susceptible spirits to add their own contributions to literature as well as to medicine.

GRANULOCYTOPENIA

Report of a Case with Autopsy

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GRANULOCYTOPENIA is characterized by a marked reduction in the number of circulating white blood cells, especially the polymorphonuclear leukocytes, with resultant impairment of the defense mechanism of the body against infection. Subsequent invasion of the respiratory and gastrointestinal tracts by the resident bacterial flora produces ulceration and necrosis. The onset of this disease may be insidious, its course dramatic and the outcome rapidly fatal. A somewhat similar clinical picture may be seen in overwhelming sepsis with extreme reduction of the white blood cells. The treatment and prognosis of the two syndromes are the same. The following case is probably of the latter sort.

CASE REPORT

D. J., a 64-year-old female, was first seen on October 6, 1936, when she requested a series of prophylactic inoculations against the common cold. She stated that she had arthritis and "heart trouble," and that she had been hospitalized on several occasions during the previous year; no satisfactory progress had been made and she had consulted a physician in another community, who had advised her to have her teeth extracted. This was done during the spring of 1936, but the arthritic pain continued, and sometimes she noted a swelling of the ankles at the end of the day.

The patient refused a general physical examination, so that a satisfactory history was not obtained. She weighed 201 lb.; the blood pressure was 170/96 and the pulse rate 100. The heart sounds were essentially normal, and there was only slight edema of the ankles. The patient was given a reduction diet and advised to report at weekly intervals for the desired inoculations.

On that day she was given 4 minims of a stock coryza vaccine subcutaneously without reaction. A week later the dose was increased to 6 minims, and on October 20, 6 minims were again administered. The blood pressure on October 20 was 160/86, and the weight was 197 lb. The urine was negative for albumin and sugar, and microscopic examination of the sediment showed nothing remarkable.

Eight hours after the last inoculation with the vaccine the patient had a severe chill and was somewhat cyanotic. She was very apprehensive but complained of no pain. She was put to bed and given 10 minims of adrenalin to combat the chill and 1 gr. of phenobarbital to allay her apprehension. The following morning there was a slight elevation of the temperature and pain in the lumbar region. Examination of the urine revealed from 15 to 20 pus cells per high-power field, with several small clumps of leukocytes and an occasional red blood cell in the sediment. On the basis of these findings a diagnosis of pyelitis was made and the patient was seen daily for the next 7 days. She responded well to bed rest and conservative measures, and was discharged as cured on October 27.

Five days later (November 1) I was called to see her in the middle of the night because of nervousness and general malaise. She said that she did not feel well and wanted to make sure that nothing was wrong. The physical findings were essentially normal and the patient did not appear ill. No blood count was done at that time.

On the morning of November 4 I found the patient slumped in her chair in an exhausted condition, complaining of sore throat. It was at once apparent that immediate hospitalization was imperative. On admission to the hospital the temperature was 102.4°F., the pulse rate 100 and the respirations 22. The white-blood-cell count was 8150, with 71 per cent neutrophils and 16 per cent small lymphocytes. The erythrocyte count was 4,000,000, and the hemoglobin 75 per cent. The patient was quite weak and complained of being chilly. The mouth was dry and the throat sore. Examination revealed several areas of shallow ulceration involving the mucous membrane of the posterior pharyngeal wall, tonsils and fauces. The lungs were clear, the heart normal, and the blood pressure 142/70. The remainder of the physical examination showed an essentially normal condition, except that the patient appeared unduly toxic. Throat smears and cultures were negative for diphtheria bacilli, but revealed many other organisms. She was given the usual routine treatment for tonsillitis and pharyngitis, but complained of progressive soreness in the throat and marked dysphagia. At 4 o'clock that afternoon the temperature had risen to 104°F., the pulse rate was 88 and the respirations were 28, but the white-cell count had dropped to 5400, with 40 per cent neutrophils and 50 per cent small lymphocytes.

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On the basis of this progressive leukopenia and the presence of the pharyngeal ulceration, a diagnosis of granulocytopenia associated with overwhelming sepsis was established. An attempt was made to obtain Pentnucleotide for intramuscular injection, but none was available until the following morning. In the meantime there was marked progression of the toxemia, and it was thought best to administer a foreign protein in an attempt to produce a leukocytosis. Accordingly 5 cc. of Proteolac was administered intravenously, and this dose was repeated at 4-hour intervals intramuscularly. In addition 10 cc. of whole blood was injected into the buttocks that evening. There was little if any favorable reaction, however, and the following morning (November 5) the temperature was 105.6°F., the pulse rate was 92 and the respirations were 34. The white-cell count had fallen to 560, with 17 per cent polymorphonuclear leukocytes and 80 per cent small lymphocytes. The nonprotein nitrogen was 41 mg. per cent. The throat showed numerous ulcerations, spotted by a grayish membrane, which also covered the base of the tongue. The patient was unable to swallow food or saliva and drooled continuously. She was extremely toxic, and her condition appeared critical. She was therefore given intravenous glucose, saline by hypodermoclysis and a transfusion of 200 cc. of citrated blood. Following these measures the temperature fell to 103.8°F., but early that afternoon there was a rise to 106°F. with a pulse rate of 120.

In spite of the administration of 10 cc. of Pentnucleotide every 4 hours during the 2nd day in the hospital, the patient rapidly became moribund. At 5 o'clock on the afternoon of November 5 the white-cell count was 750, with 17 per cent neutrophils and 82 per cent small lymphocytes. During the evening the patient developed pulmonary edema and auricular fibrillation, which could not be controlled by rapid digitalization. She went rapidly downhill and died at 3:38 a. m. on November 6, approximately 48 hours after the onset of symptoms.

An autopsy was performed 4 hours after death; an abstract of the protocol follows.

The body was that of a middle-aged white female. There was a moderate degree of rigor mortis and the skin was sallow. There was a scar of a previous surgical incision in the low midline of the abdomen. A small ecchymosis due to administration of medication was present on the right thigh. The adipose tissue appeared very soft and mushy.

The lungs were air-containing throughout, and there was no free fluid in either pleural cavity. Numerous fibrous adhesions were present at the pulmonary apices. The heart appeared essentially normal on gross examination. Atheromatous changes to a moderate degree were present at the root of the aorta. The mediastinal structures were essentially normal. The liver was especially large, but unfortunately there was no opportunity either to weigh or to measure this organ at the place where the autopsy was performed. The spleen presented an acute red tumefaction. The stomach, pancreas and intestines showed nothing unusual. The uterus showed senile atrophy, and both ovaries were absent, having been removed at a previous operation. The kidneys presented cloudy swelling and several old cysts in the cortex. The bone marrow of the femur was soft, pale and mushy, while the bone marrow of the rib was replaced by fatty tissue.

Examination of microscopic sections of the various organs confirmed the above findings of an aplasia of the bone marrow, acute splenic tumor, fatty infiltration of the liver and moderate arteriosclerosis. Sections of the bone marrow of the femur showed very little hematopoietic tissue, and the blood-forming islands that remained intact presented a majority of myeloblasts and myelocytes. Only one or two neutrophilic metamyelocytes were noted in the entire section, and no mature polymorphonuclear leukocytes were seen.

This case of granulocytopenia is reported in some detail because of its dramatic clinical course and because a postmortem examination was made. The pathologic lesions in this case were probably caused by sepsis, which produced the profound neutropenia or granulocytopenia that is typical of such a bone-marrow dyscrasia. In these cases, lymph-node and splenic enlargements are fairly common, while ulcerations of the buccal cavity and along the mucous membrane of the intestinal tract are quite characteristic. Jaundice and thrombosis of the small arterioles, accompanied by perivascular hemorrhages, are usually seen in sepsis. The complications are numerous and include such conditions as thrombophlebitis, septicemia and terminal hemorrhage, although the last-mentioned mode of exitus is rare. At necropsy, pneumonia of either the lobar or lobular type may be present, and toxic degenerative changes are commonly found in the brain, heart, liver, adrenals and kidneys.

The bone marrow at autopsy presents a primary hyperplasia of the stem cells of the myeloid series with an absence of the mature granulocytes. This is thought to be due to an arrest of the maturation of the granulocytes. The early cell forms of the myeloid series proliferate abundantly, but fail to reach maturity, probably owing to the inhibitory action of some toxic agent (overwhelming sepsis) or of some allergic action (drug idiosyncrasy) on the myeloid cells. Moreover, the inhibitive or toxic factor is selective, and confines its action to the immature myeloid cells, since the erythropoietic tissue of the marrow remains unharmed. Erythroblasts, megakaryocytes, blood platelets, lymphocytes and monocytes show no pathologic changes.

The chief etiologic agents which have been found responsible for initiating this arrest of the normal maturation of the polymorphonuclear leukocytes are aminopyrine, dinitrophenol, gold salts and organic arsenical compounds. However, there are numerous cases on record in which no history of ingestion or administration of these drugs can be obtained. It would appear, therefore, that the disease may develop in certain instances without any apparent cause. During the current year, Hench[1] has put on record a case of agranulocytosis which resulted from the administration of sulfanilamide, a popular benzene derivative, para-aminobenzene sulfonamide. More recently, fatal granulocytopenia from sulfanilamide has been reported by Borst,[2] Model[3] and Young[4] in England

and by Schwartz, Garvin and Koletsky[5] and Berg and Holtzman[6] in this country.

It has now been definitely established by extensive animal experimentation that benzene, or a benzene compound, is the one drug which will consistently produce a profound depressant action on the myelopoietic system. Kracke and Parker[7] have demonstrated that aminopyrine and its derivatives will break down on oxidation into a double benzene ring, and if this oxidation process is carried far enough it will yield a pyrazolon derivative similar to phenylhydrazine, which in turn produces an aplasia of both the red and the white blood cells of the bone marrow. Kracke and Parker have further postulated that aspirin and other drugs of this series do not break down into oxidation products and are therefore relatively nontoxic. They cite numerous cases of agranulocytosis following the ingestion of aminopyrine alone or in combination with other drugs, and publish a list of forty-six such compounds which have been condemned by the Council on Pharmacy and Chemistry of the American Medical Association. Unfortunately this list does not include numerous patent medicines and secret-formula remedies which are advertised widely to the laity through the newspapers and magazines and over the radio. The aminopyrine content of these nostrums is not known, or at least is not divulged either to the practicing physician or to the public, and there is as yet no readily available method of determining the hypersensitivity of a patient to such compounds before administration of the drug.

The distribution of these proprietary remedies — aminopyrine and sulfanilamide — has become world-wide, and coincident with their popularity the disease agranulocytic angina has been reported with increasing frequency throughout the so-called civilized countries. It was first described in Germany in 1922 by Schultz[8] and in the United States in 1924 by Lovett.[9] Kupper[10] found only two earlier reports in the literature suggestive of agranulocytic angina, those of Brown and of Türk. In 1902 Brown[11] reported a "Fatal Case of Acute Primary Infectious Pharyngitis with Extreme Leukopenia," and in 1907 Türk[12] presented an article on "Septic Disease with Atrophy of the Entire Granulocytic System."

During the past fifteen years there has been a deluge of case reports of agranulocytic angina. This disease occurs mainly in women of middle age; it has become especially prominent among the upper social classes, who apparently tend to consume large quantities of proprietary medicines containing aminopyrine or sulfanilamide, and unfortunately is found all too frequently in members of the medical and other professions.

The symptoms of agranulocytosis are due to sepsis resulting from a marked diminution or even total absence of granular leukocytes in the circulating blood. This results in a loss of cellular resistance and the advent of infectious processes of various types, often fulminating in character. Two clinical types of the disease have been described — the acute and the chronic. In the acute type, similar to the case reported herein, there is a sudden onset of malaise accompanied by sore throat and fever. The progress of the disease may be very rapid. The malaise develops into a toxemia, the elevation of temperature into a hyperpyrexia and the sore throat into ulceration, necrosis and gangrene of the mucous membranes of the respiratory, gastrointestinal and genitourinary tracts. In such cases death may ensue in from twenty-four to forty-eight hours after the onset of the symptoms, and the blood count reveals a rapidly progressive and malignant type of neutropenia.

In the chronic form the first symptoms noted are usually a feeling of malaise, weakness and mild prostration, accompanied by chills, headaches and pain in the joints. These may be followed in a few days by a slight scratchy feeling in the throat, and an elevation of the temperature by a degree or two. The most common complaint in such cases is fatigue and exhaustion, and it may well be that many middle-aged women who complain of being tired are actually suffering from a low-grade granulocytopenia. If the condition becomes progressive some degree of secondary anemia may appear in the chronic cases. Nerve pain may develop and the patient may gradually lose weight. Symptoms of functional nerve disease often confuse the clinical picture. The sore throat becomes very recalcitrant to treatment and in due course of time ulcerations may appear on the tongue, tonsils, fauces and posterior pharyngeal wall with intractable halitosis. The patient's general condition appears alarming as cachexia or a blood-stream infection sets in.

Blood counts taken during the course of such a malady reveal a progressive leukopenia, with a marked diminution of the neutrophilic percentage. In the chronic form remissions and exacerbations are the rule, and many patients have survived previous mild attacks only to succumb to a subsequent acute relapse complicated by a blood-stream infection, terminal pneumonia or fatal hemorrhage. Occasionally meningitis develops or a multiple peripheral neuritis makes the patient's condition unbearable.

The diagnosis of granulocytopenia (agranulocytosis) is based on the interpretation of the differential blood counts, which must be made in order to differentiate primary agranulocytosis, aleukemic

leukemia and aplastic anemia. If a history of administration of aminopyrine can be obtained, the problem of diagnosis is much easier; the age and sex of the patient should also be borne in mind. In short, the differential diagnosis of the leukopenic states requires great care in interpretation of the blood pictures and clinical findings in order to avoid misjudgment of the underlying lesions. It is obvious that not all cases of leukopenia are of the essential or primary type, nor are they related to granulocytopenia, malignant neutropenia or agranulocytosis.

The prognosis is poor in the acute type of the disease, in which the mortality in untreated cases averages between 75 and 85 per cent. In the chronic form the outlook is not good. Many cases may recover spontaneously upon withdrawal of the offending agent, only to develop a fatal recurrence at some future time. The appearance of eosinophils in the blood smear and a progressive increase in myeloblasts, neutrophilic myelocytes and neutrophils both point to a favorable prognosis.

Treatment of this disease resolves itself into four or five procedures. Pentnucleotide in sufficiently large doses — from 40 to 50 cc. daily — acts almost as a specific in initiating bone-marrow activity in the primary leukopenias. Prompt improvement following the intramuscular administration of nucleic acid derivatives coincides with the myelocytic response, and in a sense parallels the reticulocyte response during recovery from pernicious anemia. Adenine sulfate, another nuclein derivative, may be given intramuscularly or intravenously with good effect. The parenteral administration of liver extract and transfusions of either whole or citrated blood may be of some value as a general systemic and hematopoietic tonic, but they are not specific for this disease. Gordon[13] recommends injection of 40 cc. of whole blood intramuscularly twice a day in order to produce an irritation of the muscle tissue and thus stimulate the bone marrow. Foreign proteins are useless. Intravenous dextrose and saline solution should be administered when the pharyngitis produces dysphagia and edema. Bland mouth washes and oral hygiene are indicated in the chronic forms of this disease. A high-nuclein diet, together with dietary components rich in vitamin G, has been recommended. It is obvious that supportive measures similar to those employed in any infectious process are indicated.

Unfortunately the therapy of granulocytopenia is far from satisfactory, and many of the patients with acute fulminating forms of the disease die regardless of the treatment employed. Nevertheless, the judicious and adequate administration of Pentnucleotide both intravenously and intramuscularly has reduced the mortality from 80 per cent to approximately 25 per cent. Recovery seems to depend on early diagnosis and immediate and massive therapy. Not less than 40 cc. of Pentnucleotide should be given in a day. The most logical form of treatment is prevention, and it is obvious that once the diagnosis is made no product containing aminopyrine or sulfanilamide should be administered.

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Discussion

Dr. E. L. Amidon, Burlington, Vermont: Dr. Shaw has given us an excellent review of agranulocytosis; I cannot do better than add some data collected at the Mary Fletcher Hospital. His case differs from our cases in that his patient had sepsis, mouth lesions, a temperature of 102.4°F. and a white-cell count of 8150 and 71 per cent neutrophils. In our experience the sepsis follows the leukopenia rather than the reverse.

All the cases of Vincent's angina, gingivitis, stomatitis, aleukemic leukemia and aplastic anemia received in the Mary Fletcher Hospital have been reviewed and checked. No case of agranulocytosis was seen prior to the year 1927. During the last ten years we have had 8 cases, 7 during the last four years. The first case terminating fatally was that of a physician; the blood smears at one time revealed no granulocytes. None of the physicians who saw this case had ever before observed such a state. All but 1 of our patients had taken an analgesic drug, or had had a history of some painful ailment which might have indicated such treatment.

Of the 8 patients with agranulocytosis, 6 received Pentnucleotide. Two died and 2 showed definite improvement in the blood before the drug was given, leaving only 2 in whose cases Pentnucleotide could have been helpful.

We have recently had a patient suffering from agranulocytosis following the administration of 1000 gr. of sulfanilamide during a period of fifty days. The drug was removed, and he was given yellow bone-marrow extract. His recovery was abrupt, and was complete in ten days.

THE RELIEF OF PAIN IN CANCER

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IN CANCER the treatment of pain occupies an important place. The measures adopted, whether radiologic or surgical, radical or palliative, are often directed against both pain and disease. They are necessarily supplemented by the more or less widespread use of sedatives. In the majority of instances, even when cure has not been effected, the pain may thus be controlled. There are still, however, a considerable number of patients whose pain continues to be unrelieved in this manner. To this group, a variety of neurosurgical procedures can be applied with benefit, though this benefit may be only partial or temporary. As one's experience in dealing with such pain widens, the need of treatment becomes more obvious. One comes to feel also that treatment should be applied earlier in the disease; a short life expectancy is not necessarily a contraindication.

REFERRED PAIN

Some understanding of the mechanism of referred and radiating pain is essential for the accurate determination of its point of origin. This is true not only of lesions of the face, mouth, throat, head, neck and shoulder, which may be visible, but also and especially of the more deeply seated or concealed lesions in the viscera or parietes. Growths involving the anterior two thirds of the tongue and floor of the mouth may cause pain to be referred to the temporal region, the ear or the top of the head. Face and scalp pain follows the course of the auriculotemporal branch of the mandibular or third division of the fifth nerve. Ear pain may be referred along the tympanic branch of the glossopharyngeal nerve. With involvement of the upper alveolus, palate, antrum and upper part of the face, the pain may be local and be referred from the malar or zygomatic region part way around the orbit (zygomaticotemporal branch of the second division of the fifth cranial nerve). With disease of the posterior third of the tongue, fauces or pharynx, pain is commonly referred to the lower throat and ear, and may be aggravated by swallowing.

In disease of the cervical lymph nodes, if in the anterior triangle, the pain is local and may also be referred in front of or to the ear; if in the posterior triangle, the reference is to the posterior part of the neck and scalp.

Read before the annual meeting of the New England Surgical Society, October 2, 1937, at Providence, Rhode Island.

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SENSORY NERVE SUPPLY OF THE HEAD AND NECK

The sensory elements involved in head and neck pain are the trigeminal, or fifth, the glossopharyngeal, or ninth, and the vagus, or tenth cranial nerve; the upper five posterior cervical nerve roots; and, to an extent as yet undetermined, the sympathetic ganglia or plexuses.

The trigeminal nerve supplies sensation to most of the face as well as the scalp two thirds of the way back to the occiput, a portion of the outer upper part of the external ear, most of the tongue, — the anterior two thirds, — the floor of the mouth and palate, the eyeball and, with the aid of the sphenopalatine ganglion, the accessory air sinuses.

The glossopharyngeal nerve supplies, along with the vagus and sympathetics, the pharynx, the posterior third of the dorsum of the tongue, one half of the sides of the tongue, part of the soft palate, part of the faucial and tonsillar regions, the eustachian tube, the tympanic cavity, the inner surface of the eardrum and the mastoid cells.

The vagus nerve by its sensory connections is said to supply the skin of the posterior part of the auricle and the posteroinferior portion of the external auditory meatus, part of the external aspect of the eardrum, the pharynx in conjunction with the glossopharyngeal and the superior cervical sympathetic fibers, part of the base of the tongue, and the internal surface of the larynx (superior laryngeal nerve).

The upper five cervical posterior nerve roots supply, through the greater and lesser occipitals, the great auricular and lateral superficial cervical nerves, the skin and subcutaneous tissues of the lower part of the face, a considerable part of the external ear, the neck to below the clavicle in front, to the spine of the scapula behind, and externally to about the deltoid insertion, in addition to the posterior part of the scalp for one third the distance toward the forehead, meeting there the area supplied by the fifth nerve.

The salivary glands and the superficial and deep cervical lymph nodes receive their nerve supply from cranial, spinal and sympathetic nerves. The three large salivary glands are supplied by branches from the trigeminal nerve and from the cervical sympathetics.

NEUROSURGICAL MEASURES EMPLOYED

Broadly speaking, the neurosurgical measures employed to relieve pain comprise, in order of

frequency, (1) peripheral injection of branches of the trigeminal or fifth cranial nerve with alcohol; (2) intraspinal subarachnoid alcohol injection; (3) chordotomy; (4) spinal posterior-root section — rhizotomy; (5) intracranial cranial-nerve section — trigeminal and glossopharyngeal nerves; and (6) peripheral-nerve section — superficial cervical, inferior dental and lingual nerves. Other procedures less often used are alcohol injection of the Gasserian ganglion, myelotomy and presacral-nerve section.

As is evident, the attack centers more directly on the central and peripheral nervous system than on the autonomic, except in case of the presacral nerve. Autonomic nerve fibers involved in visceral pain, however, are sectioned in the operation of chordotomy at higher levels, and to a certain extent in spinal posterior-root section.

GENERAL PRINCIPLES OF RELIEF OF PAIN

With pain in the head, neck and shoulders, one deals with cranial or spinal nerves and their branches. The severance of these nerves involves the sacrifice of touch as well as pain sensation in a given area, but results in no hardship to the patient. An exception to the limits set in this field of activity may rarely be made in the case of bilateral intractable neck or shoulder pain, in which neither nerve roots nor peripheral nerves, but rather the spinal cord, either across the spinothalamic tracts — anterolateral columns (chordotomy) — or the commissure, might be divided (myelotomy).

To relieve upper extremity pain usually requires cutting pain-fiber tracts in the spinal cord (anterolateral columns). This operation interferes principally with pain transmission and to some extent with temperature appreciation, but leaves essentially intact those fibers mediating touch, pressure and position — an important consideration in the arms and hands. An upper extremity devoid of all modalities of sensation is practically useless. For this region, therefore, posterior-root section is undesirable.

This same method applies on the whole to similar problems below the upper extremities; that is, to those affecting the body — chest, abdomen and pelvis — and the lower extremities. In other words, relief of pain, unless due to disease which can be recognized as very limited in extent, is best obtained by rendering the entire body or one side of the body analgesic, from well above the uppermost level of pain, by a relatively limited operative procedure on the spinal cord. To be sure, resort to posterior-root section will occasionally be made, as for example in a localized lesion, often visible by x-ray as a bony metastasis, causing limited pain. Unilateral or bilateral posterior-root section, however, is as a rule a more extensive operation and is less certain to give relief. Preference over chordotomy may also be given to spinal subarachnoid injection if the patient's condition is poor and life expectancy very short, provided the diseased area comes within the supply of the roots of the cauda equina. In any case, the necessity for preserving intact the sensation of touch and position in the lower extremities is clear.

SPECIFIC MEASURES AND THEIR REGIONAL APPLICATION

Peripheral-Nerve Injection with Alcohol

Peripheral-nerve alcohol injection is largely confined to the area supplied by the fifth cranial nerve. In elderly or debilitated patients this is often the only method available where the pain is due to implication of one or more — usually the second or third — branches of the fifth nerve. Moreover, some patients, having already undergone extensive operations or radiation, refuse further surgery. The results of such an injection are often satisfactory; more so, I believe, where the second division of the nerve is involved. Disease involving the third-division supply is prone to extend downward into the lymph nodes of the neck to areas supplied by the cervical nerves, or backward into ninth-nerve territory. For this reason, third-division alcohol injection may give but partial relief. Nevertheless, alcohol injection of the second and third divisions singly or together is commonly done, and is distinctly worth while. The extraoral method should be employed. The area supplied by the first division of the fifth nerve is infrequently involved by disease causing severe pain, and alcohol injection is seldom used there. It may be tried, but its results are not particularly satisfactory. Alcohol injection is not used in ninth or tenth cranial-nerve pain, or in that involving cervical nerves.

Peripheral-Nerve Section

Section of the fifth-nerve branches or the superficial cervical nerves has a certain limited field. The inferior dental nerve may be sectioned as it enters the dental canal in the lower jaw. The lingual nerve may be sectioned in the floor of the mouth. In lesions that are not too extensive both sections may be done.

The superficial cervical nerves may be sectioned as they emerge at the posterior border of the sternomastoid muscle. In this region one finds together, and may sever, an anterior, a descending and two ascending branches (great auricular and lesser occipital). This operation is applicable when the anterior neck triangle is involved, but not in the case of the posterior one, and is seldom done.

Intracranial Operations

When the cancerous process is extensive, but involves only the branches of the fifth nerve, and if the patient's condition permits, intracranial section of the root of the fifth nerve is desirable. The section may be total, or may spare the ophthalmic division and motor root. Intracranial section of the third or the second branch, performed extradurally, is sometimes done also. The posterior root of the fifth nerve may be sectioned by either the temporal or the occipital (cerebellar) route. I prefer the former when it is feasible: that is, when it is not prevented by disease or infection in or near the operative field; and I believe it to be safer. If, however, the disease process and the pain caused by it involve adjoining areas which are supplied by both the fifth cranial and the upper cervical nerves, the cerebellar approach may be better, particularly if it is desired and is thought safe to combine a craniotomy with a laminectomy: that is, an intracranial and intraspinal section at the same operation. But this procedure cannot be tolerated in many instances of advanced cancer, such as we see at the Pondville Hospital, for example, although I have adopted it in a few cases.

Intracranial section of the ninth or glossopharyngeal nerve is sometimes done to relieve deep throat and ear pain due to cancer in the posterior tongue, throat or pharynx. This operation is done by the cerebellar route, and is not difficult — considerably less so than that of division of the fifth nerve through this approach. This procedure is helpful, but it does not always give complete relief, as we are probably also concerned in such cases with vagus and sympathetic nerves. It is ordinarily impracticable to section the ninth nerve in the neck. Rarely, in the presence of extensive disease, areas supplied by the fifth, ninth and upper cervical nerves may all be involved. In certain of these cases, intracranial section of the fifth and ninth nerves, combined with additional intraspinal section of the cervical nerves from the first to the fifth, inclusive, has been done at the same operation. I myself have not done this.

Intraspinal Operations

Cervical laminectomy and posterior-root section (rhizotomy). This operation is one that I have had many occasions to perform; I find it useful in the presence of disease in the neck giving rise to pain in the lower part of the face, neck and posterior scalp. A laminectomy — sometimes on only one side — extending from the first to the fourth cervical vertebra is performed. The first four or five posterior nerve roots on one side are then cut or crushed. The relief from neck pain is satisfactory, and patients stand the operation fairly well.

Chordotomy. The value of chordotomy, an operation first suggested by Spiller in 1911, was first fully demonstrated by the late Dr. Charles H. Frazier in 1920. It was at first used to relieve intractable pain below the upper part of the body. The operation was done at about the level of the fifth thoracic segment or the third dorsal vertebra. Since then it has been shown that in order to relieve deep, pressure pain. as well as superficial pain, — in the lower extremities, for example, — the operation must be carried as high as the third thoracic segment, that is, the first dorsal vertebra, to include all pain fibers coming from the lower extremities. To relieve arm pain, the chordotomy should be done at the sixth cervical segment or the fifth cervical vertebra.

Chordotomy — section of the spinothalamic anterolateral columns — cuts across the pain-fiber tracts. The section is made on the side of the spinal cord opposite the limb or side of the body involved by pain. The pain fibers, after entering the spinal cord on its dorsal aspect in the posterior root, cross the commissure at once or within one or two segments to the opposite side of the cord, and ascend in the anterolateral column of that side to the thalamus and thence to conscious levels of perception in the brain cortex. This column lies anterior to the pyramidal tract and the temperature fibers. To reach it, a fairly wide laminectomy is performed, preferably under local anesthesia, so as to be able to test immediately for a satisfactory level of analgesia. The dura is opened and the arachnoid incised laterally. A dentate ligament, which is a lateral prolongation of the arachnoid to the dura placed halfway between the anterior and posterior nerve roots, is cut at its dural attachment, and by traction upon it the cord is rotated so as to expose the anterolateral aspect on the side opposite the pain. A specially devised Frazier hook or a sharp-pointed knife blade is then inserted into the spinothalamic tract to a depth of from 3.5 to 5 mm. just anterior to the attachment of the dentate ligament to the cord. The blade is brought from within outward and emerges at an anterior root. Immediate and complete relief from pain is obtained. This can be verified by testing for analgesia, both superficial and deep. If a bilateral chordotomy is done, there should be a difference of about a segment in the level of the sections in order to avoid interference with cord circulation. Chordotomy may be carried out as high as the second or third cervical segment if done unilaterally, but it is dangerous to do it bilaterally because of possible injury to phrenic centers in this region. A high and a low

cervical chordotomy may, however, be done simultaneously with a fair degree of safety. Chordotomy may be employed to help pain as high as the shoulder, but for relief of pain above that level posterior-root section may be necessary, although it should not be done bilaterally. Clinically, with this there is subjective relief from pain. Objectively, there is analgesia and possibly some decrease in temperature sensation to a level a few segments below the point of chordotomy. There is little if any tactile or other sensory disturbance. There should be no motor loss unless the pyramidal tract is injured. There may be some postoperative edema, giving rise to transient weakness of an extremity, and if this occurs it is on the side of the chordotomy; that is, on the side opposite the one involved with pain. Severe and prolonged paresis occasionally results.

To relieve visceral pain, a deeper chordotomy entering the gray matter is necessary. Care must be taken, however, since too deep a cut anteriorly might catch anterior horn cells and result in muscular atrophy or some tactile disturbance. There is frequently a transient bladder-sphincter disturbance in the form of retention, lasting from a few days to a few weeks and sometimes longer. This is especially true in disease of the pelvis or the bladder wall. It may be related in part to reduction of bladder sensation, or possibly to a damaging of the motor tracts to the bladder, though their location in the cord in unknown. These patients must be catheterized early, and are sometimes put on urinary tidal drainage. In some instances we have done cystometrograms both before and after chordotomy. Because of the resulting analgesia and the poor state of nutrition of many of these patients, pressure spots are prone to develop. This necessitates unusual vigilance in the care of the skin. The pain in the analgesic area may return in a few weeks or after a much longer period. Temperature sense returns quicker than pain sense. Pain sense tends to return more quickly after unilateral chordotomy. It is possible that a few pain fibers may ascend in the homolateral spinothalamic tract.

Despite the possible complications mentioned, chordotomy remains the most reliable method for relieving pain below the neck, and I believe it should be preferred in the presence of intractable pain, unless the patient's condition contraindicates all forms of surgery.

Intraspinal (Subarachnoid) Alcohol Injection

The injection of absolute or 95 per cent ethyl alcohol into the spinal subarachnoid space has been employed with increasing frequency for relief of pain of various types; the procedure was introduced in 1931 by Dogliotti. This method of relief of pain, especially that in the lower back, pelvis and lower extremities, finds a definite field of usefulness. If the patient's condition contraindicates surgery, if life expectancy is short, if radical relief measures are refused, or if the pain is not too widespread or severe enough to require chordotomy, spinal subarachnoid alcohol injection may be used with expectation of varying degrees of relief in 60 per cent or more of cases. The procedure is employed in diseases of the cervix, rectum, prostate, bladder, and so forth.

For subarachnoid injection the patient is usually placed on his side with the side involved by disease uppermost, and the hips are slightly elevated so as to permit the alcohol, the specific gravity of which is less than that of cerebrospinal fluid, to rise and bathe the proper nerve roots. A small-gauge (No. 22) lumbar-puncture needle is used. A spinal puncture is done, and when cerebrospinal fluid is obtained the injection of alcohol is begun; it must be carried out slowly, consuming two or three minutes, so as to avoid too great diffusion, and also to avoid directing a stream of strong alcohol against one point. The process is virtually free from immediate or later discomfort. There may be a slight amount of root pain, but there usually is only a feeling of warmth or burning in the back, hip or leg during the first part of the injection. Relief if obtained is usually immediate, although occasionally it is somewhat delayed.

The location of the puncture and the amount of alcohol used are important. The second lumbar interspace may be used with success in most cases of low back, hip and leg pain. For pain about the genitals, anus or perineum, that is, pain in the sacral or coccygeal segmental distribution, a lower injection into the third or fourth interspace is preferable. In doing the latter type of injection we have recently been using the technic recommended by Drs. J. C. White and W. J. Mixter of the Massachusetts General Hospital. They advise that the lumbar puncture be done with the patient lying prone with the hips slightly elevated. The puncture is easily done, but it may be necessary to verify the entrance into the subarachnoid space by having the patient cough or by exerting suction with a syringe.

The nerve roots tolerate only a limited amount of alcohol. One may safely use a little more in the lower-level injections. In the second lumbar space from 0.5 to 0.6 cc. of 95 per cent alcohol should be the limit. The use of more is liable to produce sphincter disturbance in the form of bladder retention, which may last for a few days, or even a few weeks or longer. In the third or fourth lumbar spaces from 0.6 to 0.8 cc. may be used. Beyond this, one is liable to induce anal incontinence. Amounts greater than those mentioned may also result in

motor weakness, which may be transient or of long duration.

In the higher lumbar injections there is subjective relief, and there may or may not be slight decrease in sensation in the lower extremities. If present, this is as a rule of brief duration. In the lower lumbar injections a hypesthesia or anesthesia of the saddle-back type is frequently produced. It is relatively short-lived. The duration of relief varies. It may be days, a few weeks or longer, but ordinarily is sufficient for many of the well-advanced cases of cancer. Repeated injections are sometimes necessary. The interval between them should not be less than a week. If bilateral injections are done, it is well to limit somewhat the amount used each time. There is also some danger in elevating the hips too much, as the alcohol may extend to a level lower than desired, or may concentrate too strongly on the lowest roots, with resultant sphincter disturbance.

The length of time the patient's position should be maintained varies somewhat with different operators. Thirty minutes in the original position is about enough. It is generally felt that alcohol when given in small amounts shows some selectivity for the pain fibers in the nerve roots. These fibers are considered smaller and nonmyelinated, and thus more susceptible to alcohol. Beyond a certain point, sphincteric action as well as other forms of sensation and even motion may be affected.

Alcohol may be used above the cauda equina, and in some hands has been carried to the lower cervical level, but in such instances the procedure is fraught with a much greater degree of danger, owing to the proximity of the spinal cord and of the phrenic centers. The puncture is especially difficult above the lumbar region, and is not recommended except in isolated instances and in experienced hands. Multiple dorsal punctures with the injection of smaller amounts in each space have occasionally been used.

Further Procedures

The remaining procedures to be mentioned will not be given in detail. These are Gasserian-ganglion injection, myelotomy and presacral-nerve section.

Gasserian-ganglion injection has a limited field of usefulness, and carries with it the definite danger of injury.

The operation of *myelotomy* was introduced by Leriche in 1928, and independently by Dr. Tracy J. Putnam, of Boston, for relief of high bilateral neck or shoulder pain. It is offered where high bilateral anterolateral-column chordotomy is contraindicated because of the danger of damage to the phrenic centers in the midcervical cord. The occasion for its use is infrequent. In this operation, a narrow midline laminectomy involving several vertebrae and extending from about the midcervical to the upper dorsal region is done. A typical exposure would be from the fourth cervical to the third dorsal segment. Originally a long, fine, straight needle was inserted between the posterior columns of the spinal cord at intervals of a few millimeters up and down the exposed area, and was moved so as to pass through the commissure. A specially devised myelotome is now used. The procedure may be carried to a segment or two beyond the limits of the laminectomy. The resultant loss of sensation is two or three segments less in extent than the exposed cord. There is a loss of sensation to pinprick, but little if any loss of tactile or position sense. There may be slight atrophy of the small muscles of the hands, but this should not impair usefulness. There is no change in reflexes. In this operation there is obviously some danger of injury to the posterior columns, the anterior-horn cells, and the anterior spinal artery, and still some chance of involving the phrenic-nerve centers. So far as I know, this operation has not been done enough times to enable one to take a definite stand, although it seems to have possibilities. It should be emphasized that the loss of sensation following the operation is limited or segmental in type, and does not involve the entire body below a certain level or include the lower extremities, as is the case in anterolateral chordotomy.

Presacral-nerve section is of value in a limited number of cases with disease largely confined to the cervix or uterus. It is obviously unsuited to cases in which there are widespread metastases. I have had no experience with this operation. It can easily be done by the gynecologist or general surgeon during the course of pelvic surgery.

SUMMARY AND CONCLUSIONS

General considerations in the treatment of pain in cancer have been discussed. The role of referred pain has been mentioned, and the nerve supply involved in head and neck pain has been briefly described. The measures employed in relief of such pain have been listed. The general application of principles underlying the therapy that is employed have been given, and specific measures for relief of pain and their regional application have been offered.

The intractable pain of cancer, unrelieved by local surgery, x-ray or radium treatment or sedation, can be treated directly in a variety of ways — there being some form of treatment for almost every type of lesion in any location — and with some degree of success. The exact percentage of

complete or partial relief or failure is difficult to determine, and is influenced by the personal equation. Satisfactory relief can be obtained in about 60 per cent of cases.

262 Beacon Street.

Discussion

Dr. Ernest M. Daland, Boston: I have followed a good many of the cases treated by Dr. Hodgson, and agree with all that he has said. There are two or three other non-neurological factors in the relief of pain in cancer patients. The first is the very obvious one of surgical hygiene. Most of the pain from an infected and ulcerated carcinoma is due to secondary infection. It is quite extraordinary how much relief can be given by removing slough, using wet dressings, and so on.

The second factor is x-ray treatment. Pain from metastatic carcinoma can be controlled very efficiently by very small doses of x-ray. I refer particularly to bone metastases from carcinoma of the prostate. X-ray is specific for relief in these cases. The relief comes on within a very few days; in most cases of carcinoma of the breast, with bone metastasis, it is very quick and it sometimes lasts for many months.

The third factor is the use of drugs. We have been surprised to see what small doses of medication are required for the relief of pain in patients with advanced cancer. In most patients, mild pain can be controlled entirely by aspirin. We start with this drug, and there is no limit to the amount that can be given. The question is often raised whether or not aspirin will damage the heart. An eminent cardiologist recently said that the only people who were damaged by the use of aspirin were those who were afraid to take it. Following aspirin, we give small amounts of codeine, and combine aspirin and codeine. We insist on using hypnotics for sleep, and not narcotics. Eventually, if the pain increases, opiates have to be given, but always in small quantities, so that in the Pondville Hospital, where Dr. Hodgson does a good deal of this neurological surgery, we find very few people with advanced cancer who require morphine in any considerable quantity. I think that of the patients who die there of terminal cancer, only 10 per cent have had morphine at all, and many have had it not more than once a day.

Dr. James C. White, Boston: Dr. Hodgson has spoken briefly concerning the treatment of intractable pain by Dogliotti's method of subarachnoid injections of alcohol. Strange as it may seem, this method carries no greater risk of motor paralysis than chordotomy, but only too often it fails to give adequate relief. I think Dr. Hodgson said that in his experience only 10 per cent failed to get relief; in the cases that have been done on the neurological service at the Massachusetts General Hospital, it has been nearer 30 or 40 per cent. When the pain is bilateral, the risk of failure is far greater.

In asking me to discuss this paper, Dr. Mixter suggested that I outline a new modification of Dogliotti's method that we have been using for bilateral pain, limited to the third, fourth and fifth sacral nerves. This is the type of pain that one finds in inoperable carcinoma of the bladder, prostate, rectum and sometimes cervix. If the growth has remained localized in the neighboring soft tissues and has not spread into bone or into the lumbosacral plexus, it will give pain centered around the anus and deep in the perineum. This may be particularly distressing.

Taking advantage of the fact that alcohol is lighter than spinal fluid, place the patient in the prone position and elevate the pelvis by lowering both ends of the operating table. The tip of the sacrum and lower end of the subarachnoid space are then uppermost. A lumbar puncture between the fourth and fifth vertebrae or between the fifth lumbar and first sacral, can easily be done in this position, but when the needle enters the subarachnoid space, it is necessary to aspirate in order to get out spinal fluid, because there is not enough pressure with the head down for the spinal fluid to flow out of the needle. If a small quantity of 95 per cent alcohol is injected (we have been using 1 or 1.25 cc.), it will float caudally and infiltrate the third, fourth and fifth sacral nerves. This suffices to produce anesthesia over an area of about 15 cm. around the anus, a little way down the thighs and forward over the perineum, scrotum and penis.

We have used this procedure in 6 cases without any subsequent weakness of the legs. The patients were walking around the next day. In my opinion the reason that it does not produce motor weakness, although it knocks out the pain fibers effectively, is that these fibers are less protected by myelin than the motor fibers, and are therefore more sensitive to alcohol. This procedure may and occasionally does weaken bladder sensation. We have not seen this complication in our cases, but I am sure that we shall in the long run; we have therefore limited its use to patients who either were previously on constant drainage, such as those with carcinoma of the prostate, or had only a short time to live and were willing to go on a catheter regime. This method has been used so far in 2 cases of bladder carcinoma, 2 of prostatic carcinoma and 2 of rectal carcinoma. The injections have caused remarkably little disturbance. After being kept flat overnight, as is done in any routine lumbar puncture, the patients have gotten up, and several have been able to go home the next day. The urological cases were all on constant drainage, so that in these we had no trouble from bladder weakness, but even the 2 patients with carcinoma of the rectum were able to urinate after only one catheterization.

Finally I must mention one other point, that relief may not be permanent, but the injection can always be repeated. Mind you, these were terminal cases. In the case of the longest survival, relief has lasted for six months. Two patients had a recurrence of pain; one of them was reinjected successfully, the other one lived too far away, so his pain continued.

In summary, this method is not intended to supplant chordotomy in patients who are favorable operative risks, but in those who are in too poor condition and who have a very short time to live it is a most satisfactory substitute.

Dr. Donald Munro, Boston: Dr. Hodgson's paper is much too important in its relation to the problem of cancer as seen by general surgeons to allow it to go without some comment. Certainly this organization can be considered as being cancer-conscious, at any rate cancer-conscious in relation to the lower bowel. There is therefore no reason to exclude the other forms of cancer from discussion.

One of the methods that can be used much more than it is in the treatment of cancer has to do with the production of a permanent local anesthesia in the region of the cancer. This allows more efficient and painless treatment to be given. It applies particularly to cancer in the neighborhood of the throat and face. I have been consulted about the production of this type of anesthesia in a number of such cases, and have been sorry to observe that in almost every case a long time had elapsed during which,

if the patient had been properly anesthetized by proper nerve section, much more effective treatment could have been carried out. With section, notably that of the fifth and ninth nerves in the posterior cranial fossa, a sufficient area of the throat and face is rendered anesthetic so that extensive local treatment, including surgical excision, the implantation of radium, and so forth, can be carried out without a general anesthetic in addition. This relieves the patient of the fear caused by repeated operations under a general anesthetic, brings him back to the general surgeon for more frequent treatments, gives him a better chance to get rid of his cancer before metastases develop, and provides the surgeon with a much better method of handling this difficult problem.

The possibility of producing anesthesia by neurological methods should be emphasized much more strongly and more frequently than it is. Furthermore, it is an extremely useful adjunct in the treatment of cancer, particularly that of the face and throat, that should be more widely recognized and more commonly used by general surgeons.

DR. HODGSON: Regarding spinal subarachnoid alcohol injection, I should say that the method which Dr. White and Dr. Mixter have brought out, where the patient lies prone with his hips elevated, represents an advance in the treatment of pain about the genitals, perineum, lower spine and pelvis. One has to be careful not to elevate the hips too much, because one is liable to concentrate the alcohol rather strongly against low roots and thus produce rectal incontinence. So far as I am concerned — and I have used this method a number of times — I feel that it is unsafe to use as much as 1 cc. of alcohol. From .6 to .8 cc. is about enough; this applies to subarachnoid alcohol injection in general.

Dr. Munro's emphasis on nerve section preceding removal of cancer is to the point, and I believe that this order of procedure should be used more often.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24081

PRESENTATION OF CASE

First Admission. A fifty-nine-year-old American housewife entered the hospital with the complaint of recurring attacks of abdominal cramps occurring over a period of eight years.

During the ten years before entry she had had six or eight attacks of generalized abdominal cramps with some nausea and occasional diarrhea, but no vomiting. The attacks occurred at irregular intervals, lasted three to four days and were relieved by rest in bed, a simple diet and sedatives. She did not pass blood, pus or mucus by rectum. Three days before entry she had another attack which consisted of severe cramps, severe diarrhea and some nausea, but no vomiting or fever.

Her past history and family history were noncontributory. At the age of twenty she had weighed about 135 lb., and her weight had gradually increased until the time of entry, when she weighed about 180 lb. Her menstrual history was negative, with a normal menopause at the age of fifty.

Physical examination revealed an obese woman complaining of cramplike pain in the abdomen. There was generalized abdominal tenderness which seemed to follow the course of the colon. There was no tenderness in the region of the gall bladder, and no icterus. The pain was somewhat relieved by the patient moving about in bed.

The temperature was 98.6°F., and the respirations were 20.

The urine examination was negative. The blood showed a white-cell count of 11,100 with 65 per cent polymorphonuclears.

An x-ray of the chest showed the heart shadow to be slightly enlarged downward and to the left. The aorta was tortuous and prominent in the region of the knob, and the diaphragm was a little high on both sides and moved normally with respiration. The lung fields were clear. A gastrointestinal x-ray series and a barium enema were negative. A Graham test showed only a faint shadow of the gall bladder with many ringlike shadows in it which had the characteristic appearance of gallstones.

She was discharged after a week in the hospital and went home on a regime including a low-calorie, low-residue diet, frequent rest periods, and improved bowel hygiene.

Final Admission (nine months later). She was well until eight months after discharge, when she had a bad head cold. This cleared fairly promptly but left her with a severe cough. Three weeks later she noticed pain in her left lower quadrant which occurred only on coughing and lasted for a few minutes, but was severe enough to justify calling her physician. Four days later she suddenly developed very severe pain in her left lower quadrant which came on during a coughing spell and persisted. One hour later she was seen by her physician who found her bent over the back of a chair moaning with severe pain in the left lower quadrant. The pain was constant, but somewhat spasmodic, coming and going in waves, although she was never entirely free from pain. It was so severe that she could not lie quietly in bed. It was difficult for her to straighten up, and she preferred to remain somewhat bent over. She had no nausea or vomiting.

Physical examination revealed nothing abnormal in the heart and lungs; the blood pressure was 120 systolic, 80 diastolic. Marked spasm and tenderness were noted in the left lower quadrant over an area about the size of a man's hand. The tenderness was so acute that the examination was not entirely satisfactory. There was an indefinite feeling of a mass about the size of a grapefruit in the region normally occupied by the sigmoid, which extended up to the level of the umbilicus and down to the brim of the pelvis. Pelvic examination revealed an atrophied cervix. There was no tenderness in the vaults, and the fundus could not be felt; manual examination was impossible because of pain. The rectal examination was unsatisfactory because of hemorrhoids.

The temperature was 98.6°F., the pulse 100. The respirations were 20.

The blood showed a white-cell count of 17,400 with 80 per cent polymorphonuclears. The urine examination was negative.

She was given a subcutaneous injection of Pantopon which gave her no relief. Two hours later the white-cell count was 16,000, and shortly thereafter an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. RICHARD H. SWEET: It is interesting to note that the pain was colicky. It was a cramplike pain, not a steady one, and therefore tends to make us believe that she was not suffering primarily from an inflammatory process. Another thing which more or less bears this out is the state-

ment that the pain was somewhat relieved by moving about in bed. I should assume, therefore, that these attacks were not coming from peritoneal irritation resulting from an inflamed viscus. The repeated attacks make me think of some recurrent lesion, and this lends a little weight to the assumption that it has not always been an inflammatory process. Another thing which is of interest is that she had residual tenderness along the course of the colon. When we are dealing with a disorder of a colicky sort, such as gallstone colic, ureteral colic or intestinal colic, we often get a lot of valuable information not only out of the history of the acute attack but also from the fact that there is residual soreness, such as we find over the gall bladder after the pain has subsided and, in the case of ureteral colic, along the course of the ureter. After the acute pain begins to subside we may get a little lead from the localization of the residual tenderness.

Perhaps Dr. Hampton will tell us something about the x-rays.

Dr. Aubrey O. Hampton: This looks like a twenty-four hour film of the colon; it is the only one that shows anything that resembles a diverticulum — low in the pelvis on the right side. The barium enema shows no diverticulum, or anything else that I can see. Here is one local film that looks like the cecum and terminal ileum, and the ileum appears rather narrow. There is no dilatation proximal to it and the mucosal folds are intact. I do not believe the narrowing means anything. I cannot see anything to account for diarrhea and cramps in the abdomen. The heart is that of a fat person who is fairly old.

Dr. Sweet: Is there anything that suggests regional ileitis?

Dr. Hampton: No, I do not believe there is enough to make a positive diagnosis. The mucosa seems to be intact.

Dr. Sweet: Of course we have no reason to suspect regional ileitis in this case except that she had had repeated attacks of abdominal pain, but it was not small-intestine pain.

The description of the pain during the last attack is most interesting. Here we have a woman with an attack of pain coming on very suddenly. We also have the picture of a person who is suffering from a colicky pain, not that of peritoneal irritation. A person with peritonitis, either generalized or localized, lies quietly in bed and resists manipulation. This patient felt better when she moved about, and the story suggests a patient writhing in bed with renal colic or something like that. The fact that the pain bore a relation to severe coughing is of interest but perhaps a little difficult to explain.

The only things we have suggesting infection or inflammation are the elevated white count and the slight increase in polymorphonuclear cells. She had a normal temperature, but that in a patient who had been ill only a short time might be consistent with an inflammatory process, especially at the age of fifty-nine years.

What causes do we have for severe colic such as this? We naturally think of calculus. Did she have gallstone colic? I think not. I do not believe she has ever had gallstone colic, according to this history, because of the fact that the pain has not localized in the gall-bladder region. Unless she had a transposed viscus, with the gall bladder on the left side, I think we can readily rule that out. Renal colic will give a picture similar to this. Not infrequently people have ureteral stone which results in abdominal cramps. I have seen several patients and heard of others who were thought to have symptoms indicative of acute intestinal lesions, but who had nothing but renal calculi. We observe that her urine was negative, and that she had, on her second admission, a mass in the abdomen that would be hard to explain on the basis of renal origin unless she had an abnormally located kidney with an intermittent hydronephrosis. So, I believe we can exclude a renal origin for the pain.

What other causes of colic do we have? Did she have small-bowel obstruction? I think not; the pain is not described as being in the location where one would have referred pain of small-intestine origin.

Did she have obstruction of the large intestine — a sudden transitory affair? That is a very definite possibility. She might have had intermittent attacks of volvulus of the sigmoid or intermittent attacks of intussusception. But against that, she never manifested blood in the stools and there is no evidence of anything to incite intussusception, such as tumor or polyp.

Did she have diverticulitis of the sigmoid? Dr. Hampton has pointed out one site of a diverticulum. I should be inclined to omit that in the differential diagnosis because of the fact that the pain was so sudden in onset and because of the character of the pain, although of course we do have the fact that with the second attack she had local tenderness over the mass which was in the region of the sigmoid. All things considered I feel that she did not have diverticulitis of the sigmoid. Before we finish talking about the intestinal tract, we should consider the possibility of one of those rare internal hernias with a loop of intestine caught in a peritoneal fossa which might give her a sudden attack of intestinal obstruction. We have no evidence for it. It might be difficult to explain the tumor on that basis, but such a le-

sion ought to be mentioned in a complete discussion of the possibilities.

Is there anything connected with the pelvic viscera which might have caused these symptoms? I doubt it very much, because she has had a history of such long standing, with many attacks of pain of this same sort. If this were due to a cyst or a pedunculated fibroid with twisted pedicle or some other such source, I should expect that someone would have operated and removed the offending organ during one of the previous attacks. So I doubt that this is a cyst with a twisted pedicle or a pedunculated fibroid, although with this type of story we might very well make that diagnosis, especially with the elevated white count and relatively low temperature. I presume that it will be next to impossible for me to make the correct diagnosis in this case, but I have a feeling that the suddenness of the onset of the attacks and the fact that she has had previous attacks of a similar nature suggest that there is some mechanical obstruction to some viscus which has been repeated in the past and is perhaps the cause of the present difficulty. Considering the type of the pain, the location of the pain, the past history and the presence of tumor in the left lower quadrant in the region of the sigmoid, it would be reasonable, though probably not correct, to say that she had had a volvulus of the sigmoid, and I make that my diagnosis.

Dr. William B. Breed: I should like to ask Dr. Hampton if he could rule out a diverticulum, which had produced symptoms nine months previously, as a cause of her present symptoms.

Dr. Hampton: I think that the absence of diverticula is good evidence that it was not diverticulitis. We have seen one or two rare cases of diverticulitis where we did not see diverticula; the patients had only one or two in the whole colon and these were obliterated by disease. I think it is probable that such cases could not be diagnosed by x-ray examination.

Dr. Wyman Richardson: It is interesting that her attacks of pain started with a cough, and I wonder, with the temerity of a medical man, if this is not strangulated hernia. Can they not go up instead of down?

Dr. Sweet: Yes, that is why I thought of internal strangulated hernia. It is a very rare lesion.

Dr. Tracy B. Mallory: We have broken a precedent in this case because we ordinarily take up only cases from which some specimen has reached the laboratory as objective evidence of the diagnosis. In this case there was no specimen to examine. Dr. Allen can tell us about what he found and perhaps will discuss his preoperative diagnosis.

Dr. Arthur W. Allen: I saw this woman in the middle of the night and had a hard time coming to any conclusion about what was the matter with her. I finally arrived at the same diagnosis that Dr. Sweet has made. She was a short, fat person and difficult to examine. I tried to connect her present illness with her past history and that is where both Dr. Sweet and I fell down, because her present illness had nothing whatever to do with the preceding attacks of which she had complained. What they were due to, I have no idea — perhaps to dietary indiscretion.

The first thing that occurred to me when I saw her was a strangulated hernia. I think it is not always possible to be sure you are not dealing with strangulated interstitial hernia, but this mass was much too tender for one thing. It did not feel like any strangulated hernia that I had ever seen, and it was in the wrong location. It was well above the inguinal region and not far enough out in the flank to be one of those peculiar hernias that occasionally occur there. There is one thing not given in the history which it is only fair to state, and that is that bimanually one could be almost certain of being able to ballot this mass between the examining hands. I recall this fact quite distinctly.

The suddenness of the onset made me feel that it had to be a mechanical affair, and I had a hard time explaining the white count on the basis of the diagnosis that I made. I should be surprised if a torsion of the sigmoid would give a white count of 17,000 in a matter of hours. Her symptoms started at seven or eight o'clock at night, and I saw her shortly after midnight. I thought her white count might be in some way related to her upper-respiratory-tract infection, which she still had. The other thing that Dr. Sweet did not mention and that I very seriously considered was whether her three weeks of some sort of illness with fever and so forth might have been due to an acute inflammatory gall bladder and that the gall bladder had eroded into the intestine and produced a gallstone ileus. We got out the x-rays that had been made nine months previously and did not believe that her stones were large enough to produce obstruction, and besides, the character of the onset was not typical of gallstone ileus. I have never seen such a patient who did not vomit. Of course they do not occur every day, but when they do there is usually a story of vomiting with the obstruction, which is usually very definitely of the small-bowel type, and as a rule you do not feel a mass.

The question of twisted ovarian cyst was very carefully considered, and we felt that that probably was unlikely on the basis that this mass felt much too superficial. You could get at it too easily

from below. However, this diagnosis would have explained everything: the suddenness of onset, the severe pain, the mass, and the white count. I will say this, that when she had spinal anesthesia the mass felt quite different from what it had before, and we got our first true suspicion of what might be the matter; it then felt as if it were definitely in the abdominal wall and not within the abdominal cavity. When we opened her rectus sheath we found a large hematoma. She had ruptured her deep epigastric artery and had bled profusely into the abdominal wall.

DR. MALLORY: We have a significant number of cases every year in which lesions in the abdominal wall are mistaken for intra-abdominal disease, and it seems worthwhile reminding people occasionally of the possibility.

PREOPERATIVE DIAGNOSIS

Volvulus of the sigmoid.

DR. SWEET'S DIAGNOSIS

Volvulus of the sigmoid.

ANATOMICAL DIAGNOSES

Rupture of deep epigastric artery.
Hematoma of the abdominal wall.

CASE 24082

PRESENTATION OF CASE

A twenty-four-year-old American housewife entered the hospital complaining of pain and swelling of the left knee of four years' duration.

About four years before entry, two months after her marriage, the patient first noticed pain and swelling of her left knee which lasted for two weeks and subsided spontaneously. At the birth of her first child a number of months later she had a similar attack lasting two or three days. She had no further symptoms until twenty-three months before entry when she noticed that her knee became painful after much use. Eighteen months before entry x-rays were taken by her physician and she was advised to have her teeth extracted, which gave her no relief. Six months before entry the pain had become so severe that she was forced to discontinue her work at a shoe factory. The application of heat to the knee caused an exacerbation of the pain. For the two months before entry she had had to use crutches, and a cast had been applied without relief shortly before she came to the hospital. Her general health had been good, but her weight had fallen from 154 to 126 lb.

Her family and past histories were noncontributory.

Physical examination revealed a well-developed and nourished woman in no apparent discomfort. Her heart, lungs and abdomen were negative. Her blood pressure was 124 systolic, 76 diastolic. There was thickening of the periarticular structures about the left knee with swelling, heat and tenderness, most marked over the region of the internal femoral condyle. The knee was not reddened. There seemed to be a slight excess in the amount of fluid, but ballottement of the patella was unsatisfactory because of pain. No definite fluctuation was detected, and no involuntary spasm could be made out. There was a flexion deformity of 30°, and the range of motion was from 90 to 130°, with both limits marked by pain. The knee jerk was normal.

The temperature was 99°F., the pulse 100. The respirations were 20.

The urine examination was negative. The blood showed a white-cell count of 9400 with 69 per cent polymorphonuclears, and a hemoglobin of 85 per cent. A tuberculin test using a 1:500 dilution was positive, but the 1:5000 and 1:10,000 dilutions were negative. The serum calcium was 11.65 mg. per cent, and the phosphorus was 4 mg. per cent. The blood Hinton test was negative. A lumbar puncture was negative. No gram-negative diplococci were seen in a vaginal smear.

X-rays of the knee showed a rather extensive process involving the lower portion of the shaft of the femur. There was spur-like formation of the periosteum along its medial side and onion-layer periosteal thickening along the lateral side, producing a widening of the shaft of the femur from the lower border of the articulating surface to the level of the top of the accessory joint space. There were multiple areas of mottling within the shaft of the bone, with destruction of considerable portions of the cortex. There was very little bone atrophy; there was considerable soft-tissue shadow in the region of the upper portion of the joint capsule, but it could not be determined whether it was within the capsule or external to it. The articulating surfaces were smooth, and there was no widening of the joint space. X-rays of the chest were negative.

On the ninth day an attempt was made to aspirate the knee, but nothing was obtained. Four days later an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. ERNEST M. DALAND: The first thing to settle is whether this was an inflammatory condition in the knee or joint, or whether it was a neoplasm. Four years before entry she noticed pain which subsided within two or three days. She went along for a number of months and had pain again for two or three days, and five months later had some

teeth extracted. It is a question whether this knee condition dates back the full four years or whether in retrospect some unrelated episodes were picked out of her history. Her physician apparently thought she had an inflammatory knee and advised extraction of the teeth. The loss of weight is significant. The thickening of the periarticular structures, the cell count and the tenderness over the internal femoral condyle are also very significant. We should pay attention to the local heat and tenderness, although there was no redness of the skin. It was believed that there was some fluid in the joint, but the history tells us that when the knee was subsequently aspirated no fluid was obtained. I call your attention to the fact that she had a temperature of only 99°, which is against infection. The white count was 9400 and the smear contained 69 per cent polymorphonuclears; that is very definitely against an infection. We have nothing to lead us to think that she had an osteomyelitis, and the low white count and polymorphonuclears are definitely against it. The possibility of tuberculosis' involving the knee joint was considered, and the tuberculin test, using a 1:500 dilution, was positive. I think that can be thrown out as not significant in view of the fact that higher dilutions were negative. The calcium and phosphorus metabolism was apparently normal, which helps us to rule out a parathyroid condition. I think that we have no reason to believe there was an acute periarticular inflammatory arthritis, although that was apparently considered since a vaginal smear was done in a search for gonococci.

We come down to the x-ray examination with a very definite feeling that her trouble is due to a neoplastic condition rather than to an inflammatory one. The x-ray examination shows a single lesion in the lower end of the femur, which is characterized by both destruction and proliferation of the cortex and by the absence of any definite soft-tissue tumor. There was thickening, seen best in this film, which was probably in the capsule of the joint. The joint surfaces, however, were smooth, and the joint spaces of normal width. If this thickening were due to either tuberculosis or any other infection, I should expect more changes in the joint itself, but tumor may infiltrate a joint capsule and in that case you might get such a picture as you see here. The extent of this tumor up the shaft of the bone is considerable, yet it has not gone through the cortex completely, in other words it does not look like a primary osteogenic tumor; but here again it may belong with the irregular group. I do not believe that we have to consider tuberculosis or osteomyelitis very seriously. Syphilis should always be thought of in such a condition, but I do not consider that very seriously here.

Before seeing the x-ray I was inclined to think it was osteogenic sarcoma. The other possibility is a Ewing tumor. We do see here a little of the onion-layer appearance which, if it were more distinct, would be definitely in favor of Ewing tumor. There is no ray formation, which would be more suggestive of osteogenic sarcoma. As to age,—this woman was twenty-four,—she falls into the late group of those having a Ewing tumor and into the middle of that of those with osteogenic sarcoma, the latter usually occurring between the ages of twenty and thirty. We think of people under twenty as belonging to the Ewing group, and over twenty to the osteogenic class. The absence of a soft-tissue tumor, even with a story going on for two or three years, is definitely against an osteogenic sarcoma. The slight rise in temperature, the slight rise in white count and the local heat are more in favor of Ewing tumor, although we ordinarily see more of a rise in temperature and are rather more apt to see a white count of 12,000. I believe there is nothing suggesting a cystic condition such as osteitis fibrosa cystica or a solitary cyst. About half of all osteogenic sarcomas recorded in the literature occurred in the lower end of the femur. This is a region where we should expect to find either a Ewing tumor or an osteogenic sarcoma, but not metastatic cancer. Metastases are much more apt to appear in the upper part of the femur in the subtrochanteric region, and this woman was a little young to expect metastatic cancer, so the diagnosis is unlikely although it cannot be absolutely ruled out. Nothing here suggests any other trouble and my feeling is that this is a Ewing tumor.

DR. TRACY B. MALLORY: Dr. Simmons, have you any comment to make?

DR. CHANNING C. SIMMONS: I am not sure but I believe I know the case. Although I should agree with Dr. Daland that the tumor is not metastatic, I do not believe it is a Ewing tumor. It is a tumor of long duration, if the history is correct. The Ewing tumor ordinarily involves the shaft rather than the lower end of the bone. It is a bone-destructive rather than bone-formative tumor, and this case shows both. Although Ewing tumor in the later stages can cause a great deal of secondary bone formation, it is usually not infiltrative. The mottled appearance is not at all inconsistent with malignant lymphoma or reticulum-cell sarcoma. We have no record of a differential count. I do not know whether it would help us. The phosphatase value is not mentioned. My feeling would be that it probably is a tumor of the group of reticulum-cell sarcoma or lymphoma rather than primary bone tumor.

Preoperative Diagnosis

Neoplasm of the left femur.

Dr. Daland's Diagnosis

Ewing tumor of the femur.

Anatomical Diagnosis

Lymphosarcoma of the left femur.

Pathological Discussion

Dr. Mallory: This case is a good illustration of the truth of Dr. Codman's remark about Dr. Taylor's case several weeks ago: if the clinicians and radiologists cannot make a diagnosis it is generally pretty difficult for the pathologist to make one. It is fairly easy to rule out certain things. It certainly is not an osteogenic sarcoma or a Ewing tumor. It falls in the general group that we include in the diagnosis of lymphoma, but when it comes to subclassifying it further we begin to get a difference of opinion. We classified this, and I think all of us are still ready to stick by it, as a primary lymphosarcoma. Dr. Frederic Parker, Jr., has, I believe, seen the sections and is inclined to think it is Hodgkin's disease of the sarcomatous type. He believes that true lymphosarcoma probably never appears primarily in bone. It is true there are a few multinucleated cells here which are indistinguishable from those seen in Hodgkin's disease, but they represent a very small proportion of the tumor cells. The great majority of them look like lymphoblasts and young lymphocytes. This patient also has been followed over a period of three years and when last seen was free from recurrence.

Dr. Simmons, would you be willing to say a word about the duration of life of these bone-tumor cases?

Dr. Simmons: I have recently been reviewing the cases of osteogenic sarcoma and other malignant tumors primary in long bones that were seen in this hospital from 1920 to 1932. In this period there were 34 cases which were operated on, and I was much surprised to find that 11 were living without evidence of disease five or more years after operation. This proportion of 30 per cent five-year cures is much higher than the usual figures given for the curability of osteogenic sarcoma. It seemed worth while, therefore, to try to analyze the material further in an attempt to find some factor which might bear upon the question of prognosis. The osteogenic sarcomas could, apparently, be divided into two groups: one of rapidly growing tumors containing very pleomorphic cells; the second of tumors consisting predominantly of fibrous tissue or well-formed cartilage. None of the first group lived, whereas there were 9 survivors among the second. Another group of malignant tumors primary in bone which can be cured are the reticulum-cell sarcomas. There were 2 such cases in this series. One was operated on in 1924. In 1931 a massive recurrence developed in the soft parts above the operative stump. This was removed and the patient is perfectly well seven years later. A second case was operated upon in 1921 and died in 1935, fourteen years later, of a tumor in another bone. All the cases of Ewing sarcoma, of which there were 9, are dead. Our experience, here, is certainly different from that of other hospitals such as, for instance, the Children's Hospital. Their experience has led them to believe that osteogenic sarcoma is a uniformly fatal disease.

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BLOOD CULTURES IN PNEUMONIA

Recent experience in treating pneumonia with specific serum has demonstrated the great usefulness of determining whether the pneumococci have invaded the blood stream. Cases showing positive blood cultures usually follow a stormy course and are much more likely to end fatally than those in which the pneumococci are never found in the blood stream. To save life in the presence of bacteriemia much larger doses of serum must be used. At least one blood culture should be taken on every patient treated with serum, and repeated cultures should be made on those in whom prompt improvement fails to occur. The information gained in this way is one of the best guides in determining dosage in the serum treatment of pneumonia.

Blood cultures are also valuable in verifying the type of pneumococcus responsible for the infection. When a sputum sample is unsatisfactory and pneumococci are scarce, there is great danger that the typing report may represent a throat organism and not one causing infection in the lung. This fact may sometimes account for apparently poor results in serum therapy. If the pneumococci in both the blood culture and the sputum are identical, serum therapy can be continued with confidence that the proper type is being used.

The Massachusetts Department of Public Health announces in another column that arrangements are being made to have a number of additional laboratories undertake to examine blood cultures taken from pneumonia patients. This increase in the availability of the procedure should make it possible for physicians to follow their cases much more closely and should result in the saving of additional lives by the use of serum. The further announcement that arrangements are being made to compensate laboratories for tests done on patients who are unable to pay should also be welcome to physicians who have had difficulties in the past in arranging for laboratory work on such individuals.

DEPARTMENT OF MENTAL DISEASES — A CORRECTION

It has been called to our attention that an error was made in the editorial "Department of Mental Diseases" which appeared in the February 3 issue of the *Journal*. In speaking of the qualifications of the commissioners of the proposed Department of Mental Hygiene, as submitted by the Special Commission, it was stated: "Of the other two [the second and third commissioners], one would be a physician, not necessarily a psychiatrist, and the

other a person with civic and executive experience." While it is true that some question as to the qualifications of these two commissioners was brought up at the legislative hearing on the proposed bill, the members of the Special Commission were unanimous in supporting the bill, which reads, in part, as follows:

> The commissioner and the first associate commissioner shall be physicians who are diplomats in psychiatry of the American Board of Psychiatry and Neurology, Incorporated, and shall have had at least seven years' experience on the staff of a state or federal hospital for mental diseases or in any equivalent psychiatric organization. The second associate commissioner, if not qualified as aforesaid, shall be a physician who has had at least seven years' experience on the staff of a hospital for general medical and surgical cases.

The *Journal* is of the opinion that it would be very difficult to find an expert psychiatrist who, at the same time, would be either a well-trained engineer or an able steward — such a feeling is also implied in the proposed bill. As the construction and physical maintenance and the housekeeping problems of institutions connected with the Department of Mental Diseases, or the proposed Department of Mental Health, are of utmost importance to the proper functioning of the department, it seems advisable that well-qualified and well-trained experts in these particular aspects of mental-hospital care should have extremely responsible positions therein.

In view of the *Journal's* stand in regard to the dangers of overcentralization of power, it is gratifying to be informed that the section of the bill recommending that the power of appointment of the medical personnel and other employees should be transferred "from the trustees to the department" should read "from the trustees to the superintendents." The mistake is said to be due to technical errors in the preparation of the draft.

At a recent meeting of the Committee on State and National Legislation, the members recommended unanimously that the bill be supported by the Massachusetts Medical Society.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. Fletcher Eades, M.D., *Secretary*
19 Bay State Road
Boston

Case History No. 60. Premature Separation of the Placenta

Mrs. T. B., a white, twenty-three-year-old primipara, seven and a half months' pregnant, was advised by her physician to go to the hospital on May 20, 1937. While at dinner, she had experienced some low abdominal discomfort, which was followed two hours later by staining. An hour later she began to flow, with increased discomfort.

The family history was essentially negative. There was no history of scarlet fever, diphtheria, rheumatic fever or chorea. At thirteen the patient had had pneumonia; at fourteen her appendix had been removed, and at nineteen her tonsils and adenoids. Catamenia began at thirteen and were of the twenty-eight-day type, lasting five days without pain. Her last period was October 1, 1936, making her due July 7, 1937.

She had consulted her own physician at the very beginning of this pregnancy and had been seen routinely since then. Her blood pressure at routine visits had averaged 120 systolic, 68 diastolic. There had been no edema, and the urine had been negative except for a very slight trace of albumin during the first two months. The patient was last seen ten days previous to entrance to the hospital, at which time her examination was normal, and the blood pressure 122 systolic, 90 diastolic.

The patient was admitted to the hospital after a journey of eighteen miles by automobile. At the time of entrance she was flowing moderately. The pain in the abdomen had increased since her telephone conversation with the doctor and was very severe. The baby was active.

On physical examination the patient was well developed and nourished. Her pupils were equal and reacted normally. Mouth and throat were normal. The heart showed no enlargement; there were no murmurs. The lungs were normal to percussion; there were no rales. The abdomen was symmetrically enlarged by a pregnant uterus of approximately seven and a half months' size. The uterus was in contraction, was very tender to

A series of selected case histories by members of the section will be published weekly.

Comments and questions by subscribers are solicited and will be discussed by members of the section.

the touch, and showed no relaxation at any time. The fetal heart sounds were heard at the rate of 140 per minute. By rectal examination the cervix was found to be long, firm and undilated; there was no evidence of placenta previa. A consultant was called who agreed that the diagnosis was early separation of the placenta and that the procedure of choice was cesarean section.

A low transverse cervical cesarean section was performed. The uterus was firmly contracted around the fetus, and there was slight discoloration in the lower uterine segment near the left broad ligament. The baby was extracted without difficulty, breathed immediately, and weighed 4 lb., 9 oz. The placenta on removal showed a small area, approximately 5 cm. in diameter, near the lower border which was discolored by dark adherent blood clots. The uterus contracted well after the operation. The patient made an uneventful recovery, and the baby was 6 oz. above the birth weight on discharge from the hospital.

Comment. Cases of premature separation of the placenta occur without definite etiology. Some separated placentas occur with toxemia, others are certain to follow direct trauma, but neither was present in this particular case. The diagnosis of partial separation of the placenta in this case was based upon the firmness of the uterus, the presence of the fetal heart, and a rectal examination which did not reveal a placenta previa. Cesarean section on cases of partial separation of the placenta, where the baby is viable and the patient not in labor, is becoming the accepted method of delivery. Had this baby been dead, the more conservative procedure of rupturing the membranes, packing the cervix and applying fundal pressure would have been the operation of choice. Had the patient been in labor with either a dead or a living child, vaginal delivery should have been considered. Were the cervix soft and dilatable, rupturing the membranes and allowing labor to proceed would be the procedure of most men. The old-fashioned accouchement forcé, — manual dilatation of the cervix, — is an operation which is never done today. The cervix cannot be treated with too much respect, and manual dilatation of any cervix that is not obliterated, soft, and dilated at least three or four fingers is to be condemned.

NOTICE TO FELLOWS OF THE MASSACHUSETTS MEDICAL SOCIETY

THE *New England Journal of Medicine* is sent to all fellows whose dues are fully paid. After March 1, delinquent fellows are dropped from the mailing list. All fellows are urged to remit their dues for the current year to their district treasurers before March 1.

CHARLES S. BUTLER, M.D., *Treasurer.*

POSTGRADUATE EXTENSION COURSES

The programs of instruction to be given this spring by the Massachusetts Medical Society in cooperation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau are listed below. These courses are offered free to all legally registered physicians in Massachusetts.

BARNSTABLE DISTRICT

Place: HYANNIS

SUBJECT	DATE
Rheumatic Infection; Rheumatic Heart Disease	March 6
Recent Advances in the Diagnosis and Treatment of Heart Disease	March 13
Gonorrhea in the Male	March 20
Early Syphilis	March 27
Some Complications of Labor; Analgesics in Labor	April 3
Differential Diagnosis and Treatment of Scarlet Fever	April 10
The Use and Misuse of Prontylin	April 17
Pneumococcus Pneumonia and Serum Therapy	April 24

Meetings to be held at the Cape Cod Hospital, Sundays, at 4 p. m.

John I. B. Vail, M.D., *Chairman*

BERKSHIRE DISTRICT

Place: PITTSFIELD

SUBJECT	DATE
Pneumococcus Pneumonia and Serum Therapy	March 10
Some Complications of Labor; Analgesics in Labor	March 17
Rheumatic Infection; Rheumatic Heart Disease	March 24
Recent Advances in the Diagnosis and Treatment of Heart Disease	March 31
Gonorrhea in the Male	April 7
Early Syphilis	April 14
Differential Diagnosis and Treatment of Scarlet Fever	April 21
The Use and Misuse of Prontylin	April 28

Meetings to be held at the House of Mercy Hospital, Thursdays, at 4:30 p. m.

Melvin H. Walker, Jr., M.D., *Chairman*

BRISTOL SOUTH DISTRICT

Place: FALL RIVER

SUBJECT	DATE
Atelectasis in the Newborn	March 7
Bleeding in the First Trimester of Pregnancy	March 14
Treatment of Burns	March 21
Bleeding in the Last Trimester of Pregnancy	March 28
The Use of Vitamins in Pediatric Practice	April 4
Cesarean Section: Analgesia	April 11
Drug Therapy in Pediatrics	April 18
Toxemias	April 25

Acute Anterior Poliomyelitis — Its Diagnosis and Treatment	May	2
Sepsis	May	9

Meetings to be held at the Union Hospital, Mondays, at 4:30 p. m.

Howard P. Sawyer, M.D.,
Robert H. Goodwin, M.D.,
Chairmen

Essex North District

Place: LAWRENCE

SUBJECT	DATE	
Atelectasis in the Newborn	March	11
Bleeding in the First Trimester of Pregnancy	March	18
Treatment of Burns	March	25
Bleeding in the Last Trimester of Pregnancy	April	1
The Use of Vitamins in Pediatric Practice	April	8
Cesarean Section: Analgesia	April	15
Drug Therapy in Pediatrics	April	22
Toxemias	April	29
Acute Anterior Poliomyelitis — Its Diagnosis and Treatment	May	6
Sepsis	May	13

Meetings to be held at the Lawrence General Hospital, Fridays, at 4 p. m.

John Parr, M.D., *Chairman*

Franklin District

Place: GREENFIELD

SUBJECT	DATE	
Differential Diagnosis and Treatment of Scarlet Fever	March	9
The Use and Misuse of Prontylin	March	16
Some Complications of Labor; Analgesics in Labor	March	23
Rheumatic Infection; Rheumatic Heart Disease	March	30
Recent Advances in the Diagnosis and Treatment of Heart Disease	April	6
Pneumococcus Pneumonia and Serum Therapy	April	13
Gonorrhea in the Male	April	20
Early Syphilis	April	27

Meetings to be held at the Franklin County Hospital, Wednesdays, at 8 p. m.

Halbert G. Stetson, M.D., *Chairman*

Hampden District

Places: HOLYOKE, SPRINGFIELD

SUBJECT	DATE	
Rheumatic Infection; Rheumatic Heart Disease	March	10
Recent Advances in the Diagnosis and Treatment of Heart Disease	March	17
Pneumococcus Pneumonia and Serum Therapy	March	24
Gonorrhea in the Male	March	31
Early Syphilis	April	7
Some Complications of Labor; Analgesics in Labor	April	14
Differential Diagnosis and Treatment of Scarlet Fever	April	21
The Use and Misuse of Prontylin	April	28

Meetings to be held Thursdays at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, at 4 p. m., and in the Outpatient Department of the Skinner Clinic, Holyoke Hospital, Holyoke, at 8 p. m.

George D. Henderson, M.D.,
George L. Schadt, M.D.,
Chairmen

Hampshire District

Place: NORTHAMPTON

SUBJECT	DATE	
Early Syphilis	March	9
Gonorrhea in the Male	March	16
Differential Diagnosis and Treatment of Scarlet Fever	March	23
The Use and Misuse of Prontylin	March	30
Rheumatic Infection; Rheumatic Heart Disease	April	6
Recent Advances in the Diagnosis and Treatment of Heart Disease	April	13
Pneumococcus Pneumonia and Serum Therapy	April	20
Some Complications of Labor; Analgesics in Labor	April	27

Meetings to be held in the Nurses Home of the Cooley Dickinson Hospital, Wednesdays, at 4:15 p. m.

Warren P. Cordes, M.D., *Chairman*

Middlesex South District

Place: CAMBRIDGE

SUBJECT	DATE	
Bleeding in the First Trimester of Pregnancy	March	9
Atelectasis in the Newborn	March	16
Bleeding in the Last Trimester of Pregnancy	March	23
Treatment of Burns	March	30
Cesarean Section: Analgesia	April	6
The Use of Vitamins in Pediatric Practice	April	13
Toxemias	April	20
Drug Therapy in Pediatrics	April	27
Sepsis	May	4
Acute Anterior Poliomyelitis — Its Diagnosis and Treatment	May	11

Meetings to be held at the Cambridge Municipal Hospital, Cambridge Street, Wednesdays, at 4 p. m.

Edmund H. Robbins, M.D., *Chairman*

* * *

Faculty

Gonorrhea and Syphilis. Chairman: Dr. E. Granville Crabtree. Instructors: Drs. J. Dellinger Barney, Oscar F. Cox, Jr., Roger C. Graves, George C. Prather, Rudolph Jacoby and C. Guy Lane.

Heart Disease and Rheumatic Fever. Chairman: Dr. Paul D. White. Instructors: Drs. Edward F. Bland, Marshall N. Fulton, R. Earle Glendy, Ashton Graybiel, Burton E. Hamilton, T. Duckett Jones, Samuel A. Levine, Benedict F. Massell, Sylvester McGinn, Joseph H. Pratt, William D. Reid, Howard B. Sprague and Oliver H. Stansfield.

Pneumonia. Chairman: Dr. Frederick T. Lord. Instructors: Drs. Maxwell Finland and Joseph H. Pratt.

Obstetrics. Chairman: Dr. Robert L. DeNormandie. Instructors: Drs. Christopher J. Duncan, M. Fletcher Eades, A. Gordon Gauld, Thomas R. Goethals, Roy J. Heffernan, James C. Janney, M. V. Kappius, Foster S. Kellogg, H. Bristol Nelson, Joseph W. O'Connor, John Rock, Judson A. Smith, Benjamin Tenney and Raymond S. Titus.

Pediatrics. Chairman: Dr. Warren R. Sisson. Instructors: Drs. Robert H. Aldrich, James M. Baty, Benjamin W. Carey, Jr., Stewart H. Clifford, Louis K. Diamond, R. Cannon Eley, Leroy D. Fothergill, Harold L. Higgins, Henry W. Hudson, Jr., Donald W. MacCollum, Patrick J. Mahoney, Charles F. McKhann, Edwin H. Place, Eli C. Romberg, Clement A. Smith and Conrad Wesselhoeft.

There will be a presentation of cases in the sessions on rheumatic fever and heart disease wherever it is feasible. All courses will be aided by new lantern slides, many of which are in natural color. The faculty have prepared an unusually fine teaching exhibit which should be interesting to every physician.

* * * *

The following sessions are arranged for the week beginning February 28:

ESSEX SOUTH

Tuesday, March 1, at 4:00 p. m., in the Nurses' Home of the Salem Hospital, Salem. Subject: Early Syphilis. Instructor: Rudolph Jacoby. Walter G. Phippen, *Chairman.*

MIDDLESEX EAST

Tuesday, March 1, at 4:00 p. m., at the Melrose Hospital, Melrose. Subject: Drug Therapy in Pediatrics. Instructor: Warren R. Sisson. Joseph H. Fay, *Chairman.*

NORFOLK

Friday, March 4, at 8:30 p. m., at the Norwood Hospital, Norwood. Subject: Treatment of Burns. Instructor: Henry W. Hudson, Jr. Hugo B. C. Riemer, *Chairman.*

NORFOLK SOUTH

Monday, February 28, at 8:30 p. m., at the Quincy City Hospital, Quincy. Subject: Pneumococcus Pneumonia and Serum Therapy. Instructor: Joseph H. Pratt. David L. Belding, *Chairman.*

PLYMOUTH

Tuesday, March 1, at 4:00 p. m., in the Rosa Field Nurses' Residence, Brockton Hospital (rear of hospital), Brockton. Subject: Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor: Paul D. White. Walter H. Pulsifer, *Chairman.*

WORCESTER (Milford Section)

Thursday, March 3, at 8:30 p. m., in the Nurses' Home of the Milford Hospital, Milford. Subject: Sepsis. Instructor: Christopher J. Duncan. Joseph Ashkins, *Chairman.*

NEW HAMPSHIRE MEDICAL SOCIETY

NEW HAMPSHIRE HEALTH NOTES

The expansion of health services made possible by social-security funds is still in the development period. It is safe to say that the services of every division have increased for the common good, and that new services have been made possible in all divisions.

The Maternal and Child Health Division now has a medical director. Increased personnel has made possible better and more universal service, state-wide in scope. The maternal mortality has reached a new low in 1936, being 4.81 per 1000 births (urban 6.05 and rural 3.20). Maternity centers are conducted in Concord, Berlin, Portsmouth and Goffstown.

The Crippled Children's Division is new in the State Health Department. The 1936 legislature appropriated $11,000 for this service, which, matched by federal funds, provides for care of crippled children under twenty-one years of age. On the State Register at the end of September, 1937, were listed 1060 children. There is plenty of work to be done in this service and many uses for this appropriation. The State clinic is held at the New Hampshire Memorial Hospital, Concord, the second Thursday of each month; there are an orthopedic surgeon, a neurologist, and a pediatrician in attendance.

SERUM TREATMENT OF PNEUMONIA

It has been announced by Dr. Travis P. Burroughs, secretary of the New Hampshire State Board of Health, that plans are being made concerning pneumonia control throughout the state, especially as regards the providing of free serum. At the present time, the laboratory of the Board of Health in Concord is doing Neufeld typings at any time of the day or night on sputum that is brought to it by messenger. The results are reported immediately, and if the case is treatable, a sufficient quantity of serum is given to the messenger with absolutely no cost.

The only laboratory authorized to do sputum typing for pneumonia and to provide free serum is the State Laboratory at Concord. The reports of typings done at other laboratories are not accepted. However, plans are being made to provide centers all over the state where a competent technician will be present at all times and where serums will be available for the treatable types.

PERSONALS

Dr. Timothy F. Rock, of Nashua, is New Hampshire chairman of Tufts College Medical School campaign. The new sound film, "The Family Doctor," is being shown in various parts of the state under Dr. Rock's direction.

Dr. William M. Prince, formerly university physician at Durham, has opened an office for the general practice of medicine. Dr. W. G. McGregor is temporarily in charge of the university infirmary and Hood House.

Miss Myrtle Flanders, because of poor health, has resigned her position as head of the New Hampshire Chapter of the American Red Cross. Miss Ruth Kernodle will represent the national organization.

Dr. W. J. Paul Dye, of Wolfeboro, has given several lectures on surgical topics before service club and women's organizations during the past four months.

Dr. Elizabeth G. Samoylenko, formerly on the staffs of the Massachusetts General Hospital and the Massachusetts Eye and Ear Infirmary, has opened an office for the practice of urology at Manchester.

Dr. Ludwig Mendelson has opened an office for the practice of surgery and gynecology at Dover.

NOTES

At the annual meeting of the Laconia Hospital Association, Miss Lillian G. Williams, superintendent, reported the most active year in the history of the hospital. Over 2000 in-patients were treated in 1937, with a total income of $133,903, and expenditures of $133,360. Over 1400

operations were done. Two hundred and fifty babies were born in the hospital.

Dr. Sven Gundersen was the guest speaker at the annual meeting of the Belknap County Medical Society. His topic was "Serum Treatment of Pneumonia."

DEATHS

SISKE — HARRY E. SISKE, M.D., died at the Hanover Hospital on November 2. He was born in Monson, Massachusetts, in 1877, and was graduated from Monson Academy and Tufts College Medical School.

He had been employed as a physician at the State Hospital in Concord, at the Penal Institution at Providence, Rhode Island, and at the Memorial Hospital in Pawtucket, Rhode Island. He had also been roentgenologist at St. Joseph's Hospital, Providence, Rhode Island. At the time of his death Dr. Siske was assistant superintendent at the New Hampshire State Sanatorium at Glencliff.

In 1927 he was married to Ethel Bennett Stubbs, of South River, New Jersey.

Dr. Siske was a member of the Grafton County and New Hampshire medical societies.

PLATTS — HARRY S. PLATTS, M.D., of Troy, died on January 5. He had practiced medicine in Troy for more than thirty-five years.

Dr. Platts was born in 1876. He was graduated from the Dartmouth Medical School in 1898, and was a member of the New Hampshire Medical Society, the Masonic Order and the American Legion.

LUNDERVILLE — EVEROY P. LUNDERVILLE, M.D., died February 4 at his home in Berlin. He was born in 1874 at Enosburg Falls, Vermont, the son of Mr. and Mrs. Matthew Lunderville.

Dr. Lunderville graduated from the University of Vermont College of Medicine in 1896. He was also a registered pharmacist. Before going to Berlin twenty years ago, he practiced medicine in St. Albans and Richford, Vermont. He was married to Hortense Virginia Paquet in St. Albans, Vermont, in 1900.

Dr. Lunderville is survived by his widow; one daughter, Mrs. Everett J. Carney, of Bellows Falls, Vermont; one brother; and two sisters.

VERMONT STATE MEDICAL SOCIETY

MAURICE — GEORGE B. MAURICE, M.D., of Waterville, Vermont, died November 30, 1937. He was in his sixty-fifth year.

Born in Waterville, Vermont, the son of Daniel F. and Mary P. Maurice, he received his early education there. He received his degree from the University of Vermont College of Medicine in 1899 and had practiced in Waterville for nearly forty years. Dr. Maurice was a member of the Vermont State Medical Society.

His widow survives him.

MISCELLANY

DR. JAMES MINOT HONORED

At the annual meeting of the Boston Tuberculosis Association held February 15 a new office was created, that of honorary president, and Dr. James J. Minot, of 188 Marlboro Street, Boston, who was a founder of the Association in 1903, was elected to fill this office. In making the nomination Dr. Reginald Fitz spoke as follows:

"On April 21, 1903, at the suggestion of Dr. Minot, a group of gentlemen met in the library of his Boston home to form the Boston Association for the Relief and Control of Tuberculosis. In this manner our Society originated. Ever since that day Dr. Minot has given, continuously, enthusiastic and imaginative service to the Association. In the early days, his efforts were largely instrumental in bringing it about that tuberculosis in Boston was made a reportable disease and it became possible to discover how many cases there were in the community and how significant was the tuberculosis problem. Presently he organized a day camp on Parker Hill for the care of tuberculous patients. The Boston Sanatorium is an outgrowth of this action. He then helped to develop outdoor schools for tuberculous children and methods for stamping out tuberculosis by examining contacts. He became influential in developing municipal health clinics where cases were followed or where individuals suspected of harboring tuberculosis were skillfully examined and in establishing laboratories wherein the diagnosis of tuberculosis was made scientifically. He was soon recognized as a pioneer in educating the public in regard to the menace of tuberculosis and in enlisting public interest in the fight against it. As time went on he became increasingly impressed with the necessity for preventing tuberculosis. Hence, nutrition clinics for delicate children grew up in our schools and the Prendergast Preventorium came into being. He has helped to raise large sums of money to fight tuberculosis; money raised from a host of small contributions through the selling of Christmas Seals each year and through certain individual citizens who have contributed to the cause in a more significant manner from time to time because of his honest, dogged pleading. In brief, for thirty-five years without interruption, Dr. Minot has set the pace toward wiping out the menace of tuberculosis in Boston. He has done all in his power to improve methods of diagnosis and treatment for the ill so that they might be cured, and to forestall the development of the disease in those who were not ill by sensible means of prevention. Since 1919 he has served our Association as vice-president. It is the well-considered opinion of the Executive Committee that after so long a term of service a more distinctive office should be made for him. The Executive Committee wishes to have the benefit of his counsel and inspiring influence in its work; on the other hand, the committee does not wish to overload him with administrative details. Therefore, the committee asks that a new office in the roster of the Association be created: that of honorary president. To fill this office, it is my privilege to bring before you for consideration the name of James Jackson Minot. I move that the members of the Boston Tuberculosis Association signify by a rising vote their unanimous assent to the election of Dr. Minot as their honorary president."

HARVARD UNIVERSITY APPOINTMENTS

Dr. Kurt Goldstein, head of the neurophysiological and psychopathological laboratory of the Montefiore Hospital, New York City, has been appointed William James lecturer on philosophy and psychology at Harvard University next year.

Teaching and research staff appointments include the following: Eric G. L. Bywaters, of London, England, research fellow in medicine; Eugene R. Sullivan, of Fall River, Henry P. Walcott Fellow in Clinical Medicine; Adolph L. Sahs, of Iowa City, Iowa, research fellow in neurology; Unto U. Uotila, research fellow in physiology and anatomy; Volta R. Hall, Jr., of Cleveland, research fellow in psychiatry; Joseph L. Lewis, of Dorchester, as-

sistant in pediatrics; Henry C. Marble, of Boston, assistant in industrial hygiene; William F. Dolan, of Arlington, assistant in industrial hygiene; George W. Morse, of Brookline, assistant in industrial hygiene; and Philip C. Trexler, of South Bend, Indiana, research fellow in bacteriology.

CORRESPONDENCE

SERUM TREATMENT OF PNEUMONIA

To the Editor: The success of the program being carried on by the Massachusetts Department of Public Health to decrease deaths from pneumonia by use of specific serums is dependent upon encouraging physicians to make use of the facilities at their disposal. One important phase of this matter is making laboratory facilities easily available. A sufficient number of hospitals are co-operating in this plan so that typings can now be done in every part of the State. Many physicians have been making use of the laboratory facilities for typing pneumococci from sputum.

The facilities for isolating pneumococci from the blood stream, on the other hand, have not been so widespread, and such service has been available only in larger hospitals. This shortcoming is being remedied as rapidly as possible. A number of additional laboratories are adding this test to those offered to physicians. The outfits for collecting blood samples can be obtained at the same time as the therapeutic serum. They should be returned to the same laboratory by messenger, since they do not conform to postal regulations and consequently cannot be mailed.

An additional handicap has been that in parts of the State some distance removed from the Bacteriological Laboratory at the State House, patients who have been unable to pay for laboratory work have been dependent upon the generosity of the local hospitals for typing service. A fund has been set up to be used in paying approved laboratories for tests done on such patients. In this way, the burden will be removed from the local laboratories, and physicians will feel much freer to have sputum typings and blood cultures done on indigent patients.

In order to safeguard the expenditures from this fund, regulations in regard to payments from it have been set up by the department. These are as follows:

> Payments will be made for typing pneumococci from sputum and blood cultures from persons having, or suspected of having, pneumonia under the following conditions:
>
> 1. If the tests are done for patients outside the hospital in which the typing laboratory is situated.
> 2. If the laboratory requesting payment is approved by this department for doing such tests; if the tests are performed or checked by an approved technician; and if the laboratory certifies that payment for the tests has not been made.
> 3. If the physician when submitting the specimen certifies over his signature that the payment of the charges would be an undue hardship on the patient.
> 4. If the number of examinations on a single patient is reasonable and satisfactory explanation for repeated tests accompanies the bill.
> 5. If the pneumococcus typing has covered all the types for which typing serum is provided by the department.
> 6. If the bill is submitted for approval by the 10th of the next succeeding month after the tests are performed.

Item four should not be interpreted as limiting the number of tests to one sputum and one blood culture. Additional sputum samples should be examined on every patient who does not respond promptly to serum therapy. At least one blood culture should be done on every patient. In addition, further specimens should be obtained from those who have shown a previously positive blood culture, or from patients in whom the temperature fails to drop after serum therapy.

HENRY D. CHADWICK, M.D.,
Commissioner of Public Health.

State House,
Boston.

SUPPORT OF LEGISLATIVE COMMITTEE

To the Editor: We now have as chairman of the Committee on State and National Legislation of the Massachusetts Medical Society, Dr. Charles Lund, of Boston, who is putting his heart and soul into the work at hand. We in Hampden County have felt that the legislative program cannot be entirely handled at the State House. With this thought in mind, on Saturday night, February 12, the district society invited the senators and representatives from this district to a steak dinner at the Highland Hotel. Along with the legislators we invited our local members who are active in civic and political life, in some cases the family doctor of this or that legislator, and outstanding men whose presence would lend dignity and weight to our cause. Our local president, Dr. Allen G. Rice, presided, and Dr. Lund made a trip from Boston to explain our position on pending bills in which we are interested.

A feeling of respect and confidence was present throughout the evening. The legislators asked many questions and showed an intelligent interest in solving problems as presented for the best interest of the State of Massachusetts. On this ground we are never fearful of the result.

Dr. Lund impressed the legislators and the doctors with his sincerity, his intelligence and his fair-mindedness, and I am writing this letter to the *Journal* so that the other district societies throughout the State may consider making an effort comparable to ours. We believe that the legislators should understand health problems, and realize that the doctors are really interested in what their elected representatives do. Our opponents are ever on the alert, and we cannot expect legislators to believe very much in the plea of physicians who are strangers to them, when the doctors in their own districts do not take the time to interest themselves in these health measures.

We should very much like to see every county society doing its bit toward a united front. There is no reason why a few should have to do the work for the many.

W. A. R. CHAPIN, M.D.,
Legislative Chairman,
Hampden County Medical Society.

121 Chestnut Street,
Springfield, Massachusetts.

SUSPENSION OF LICENSE

To the Editor: This is to inform you that at the meeting of the Board of Registration in Medicine held February 10, 1938, it was voted to suspend for one month the license of Dr. Edward Fentin, 236 Seaver Street, Dorchester, Massachusetts, because of his testimony in court.

STEPHEN RUSHMORE, M.D., *Secretary.*

Board of Registration in Medicine,
State House, Boston.

HEALTH-CONTEST QUESTIONNAIRES

To the Editor: The Boston Health Department has recently asked Boston physicians to furnish certain statistical data for use in a health contest conducted by the United States Chamber of Commerce.

The questions to be answered concern chiefly the prophylactic immunizations carried out on children and the obstetrical and genitourinary cases treated privately by individual physicians during the year 1937. The letter accompanying the questionnaire explains that such information will presumably show how well we, as a class, meet this modern problem of health conservation.

No one will question the wisdom and desirability of such a campaign, but one must wonder at the naïveté with which our health authorities expect such information without having previously given notice that such statistics would be called for.

To quote a very reputable physician who is also a high official in one of our medical societies: "While we may keep good records of our individual cases, one rarely keeps separate any record of the number of inoculations or the number of pneumonias." We shall be able to wade through it somehow, but one feels that the information so obtained must of necessity be either grossly exaggerated or just as badly underestimated, according to the mood or memory of the individual supplying the data. By no means can it be called a fair estimate of the actual amount of preventive work done by our private practitioners.

If our health authorities are really interested in such statistics, they should furnish us with the proper charts so that we can keep constant records of such work. In this way desired information could easily be obtained at any time, and it would be both genuine and valuable; the figures so obtained would also show the staggering amount of work really done, and the oft-repeated statement that private practitioners are not interested in preventive medicine would prove to be nonexistent.

RUBIN GURALNICK, M.D.

256 Bennington Street,
East Boston, Mass.

RECENT DEATHS

REARDON — TIMOTHY J. REARDON, M.D., of 76 Commonwealth Avenue, Boston, died February 17. He was in his sixty-sixth year.

Born in Boston he received his early education in the local schools, later earning his way through Harvard Medical School from which he received his degree in 1894. He spent the next three years at the University of Vienna, following which he spent two years at the Université de Paris and one year in London hospitals.

On his return to Boston he specialized in diseases of the nose and throat. At one time a trustee of the Boston City Hospital, he was also staff physician at the Carney Hospital and the Boston School for the Deaf at Randolph.

Dr. Reardon was a fellow of the Massachusetts Medical Society and the American Medical Association. He was a member of the New England Otological and Laryngological Society and the Boston Medical Library.

His two sisters, the Misses Nellie and Mary Reardon, survive him.

HARE — E. TREEN HARE, M.D., of 225 High Street, Holyoke, died February 17. He was in his thirty-sixth year.

A native of Gilbertville, he received his degree from the University of Vermont College of Medicine. He served internships at the Eye and Ear Hospital, Brooklyn, and the Roosevelt Hospital, New York City, after which he opened an office, specializing in eye, ear, nose and throat diseases.

Dr. Hare was a fellow of the Massachusetts Medical Society and a member of the American Medical Association.

MOLLICA — ZACHARY A. MOLLICA, M.D., of 48 Prentiss Lane, Belmont, died at sea, January 31. He was in his fiftieth year.

Dr. Mollica received his degree in 1912 from the Medical College of the State of South Carolina. Following his graduation he specialized in surgery.

He was a fellow of the American Medical Association and the Massachusetts Medical Society.

His widow survives him.

NOTICES

BOSTON DISPENSARY

25 Bennet Street, Boston
Lecture Hall, Second Floor, 9-10 a. m.

The Boston Dispensary will hold its next medical conference on Friday morning, February 25.

Dr. John G. Gibson, Jr., will speak on "Clinical Studies of Blood Volume." He was invited to address the meeting in place of the previously announced speaker, Dr. Bernard Jacobson.

* * *

MEDICAL CONFERENCE PROGRAM, MARCH, 1938

Tuesday, March 1 — Injuries to the Epiphyses. Dr. John D. Adams.
Wednesday, March 2 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Thursday, March 3 — Social Instability and the Doctor. Prof. Elton Mayo.
Friday, March 4 — Mumps. Dr. Conrad Wesselhoeft.
Saturday, March 5 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Tuesday, March 8 — Phlebitis. Dr. Edward A. Edwards.
Wednesday, March 9 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Thursday, March 10 — Social Service Case Presentation. Mrs. H. B. Hooker and Miss E. Grundy.
Friday, March 11 — Some of the Newer Aspects of Collapse Treatment of Pulmonary Tuberculosis. Dr. Richard H. Overholt.
Saturday, March 12 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Tuesday, March 15 — Clinicopathological Conference. Dr. R. C. Wadsworth.
Wednesday, March 16 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Thursday, March 17 — Allergic Manifestations in Certain Dermatoses: Their Recognition and Treatment. Dr. Francis M. Thurmon.

Friday, March 18 — Certain Clinical Features of the Natural History of Rheumatic Fever and Heart Disease. Dr. T. Duckett Jones.
Saturday, March 19 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Tuesday, March 22 — X-ray Demonstration. Dr. Alice Ettinger.
Wednesday, March 23 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Thursday, March 24 — Some Practical Considerations of Muscle Imbalance. Dr. Joseph J. Skirball.
Friday, March 25 — Some Aspects of Pneumonia Therapy. Dr. Maxwell Finland.
Saturday, March 26 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Tuesday, March 29 — A Clinical Evaluation of the Blood Sedimentation Rate as a Routine Diagnostic Procedure. Dr. Elbert B. Agnor.
Wednesday, March 30 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Thursday, March 31 — Interesting Clinical Problems from the District Service. Dr. Isadore Olef.

RADIO BROADCASTS

The sixth group of weekly broadcasts sponsored by the American Medical Association and the National Broadcasting Company concern public health. These dramatized health messages are intended to furnish supplementary material for health teaching in junior and senior high schools and are broadcast every Wednesday from 2:00 to 2:30 p. m. over the Red Network. The dates and subjects are as follows:

March 2 — Water, Waste and Sanitation. Importance of community control of water supplies, sewage disposal and general sanitary matters.

March 9 — Protecting Perishable Foods. What the community can and must do to protect fresh foods such as fish, fruits, vegetables, meats, bakery goods.

March 16 — Keeping Books on Health. The meaning and the importance of vital statistics, contagious-disease reporting and community-health records.

March 23 — Catching Disease from Animals. Rabbit fever, rabies, undulant fever and similar infections, and what can be done about them.

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve-thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. All kinds of tumors are seen, discussed, and when indicated, treated with radium and high-voltage x-ray.

Physicians are welcome to visit this clinic and bring a patient to the clinic for diagnosis.

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the New England Deaconess Hospital, on Monday, February 28, at 8:15 p. m.

PROGRAM

Prognosis of Adult Women with Mitral Stenosis. Dr. Burton E. Hamilton.
The Heart in Postoperative Deaths. Dr. Shields Warren.
A Case of Congenital Heart Block. Dr. William B. Stevens and Dr. F. Gorham Brigham.
Heart Noises. Case report. Dr. Frank N. Allan.
Cardiovascular Disease in Diabetes. Dr. Howard Root.
Selection and Operative Treatment of Hypertension. Dr. Elmer C. Bartels.
Congestive Failure on Using Digitalis. Dr. Lewis Hurxthal.

Interested physicians and medical students are invited to attend.

JAMES M. FAULKNER, M.D., *Secretary.*

NEW ENGLAND PEDIATRIC SOCIETY

The regular meeting of the New England Pediatric Society will be held at the Massachusetts General Hospital, on Friday, February 25. The clinical program will begin at 4:30 p. m., and the evening meeting at 7:45. Dr. Joseph C. Aub will speak on "Endocrine Disorders of Childhood."

CARNEY HOSPITAL

The John T. Bottomley Society of the Carney Hospital Out-Patient Department will hold its regular monthly meeting on Tuesday, March 1, at 11:30 a. m. Dr. William E. Browne will speak on "Important Bony Land Marks and Surface Markings of Various Anatomical Spaces."

WILLIAM J. MACDONALD, M.D., *Secretary.*

THE FAULKNER HOSPITAL

The usual clinicopathological conference will be held at the Faulkner Hospital for its staff and any other interested members of the medical profession on Thursday, March 3, at 5:00 p. m.

There will be a discussion of cases by Dr. Marshall K. Bartlett and Dr. Maurice B. Strauss.

JOHN B. HAZARD, M.D., *Secretary.*

BOSTON UNIVERSITY MEDICAL SOCIETY

The next meeting of the Boston University Medical Society will be held in the Evans Memorial Auditorium, 78 East Concord Street, Boston, on Monday, March 7, at 12 o'clock noon.

Dr. Morris Fishbein, editor of the *Journal of the American Medical Association,* will speak on "Quacks and Quackery."

Medical students, nurses and physicians are cordially invited to attend.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, March 8, at 8:15 p. m.

PROGRAM

Presentation of Cases.
Exchanges between Cells and Interstitial Fluid. Dr. John P. Peters, New Haven, Connecticut.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary.*

SOCIETY MEETINGS AND CONFERENCES

Calendar of Boston District for the Week Beginning Monday, February 28

Monday, February 28

*8:15 p. m. New England Heart Association. New England Deaconess Hospital.

Tuesday, March 1

*9-10 a. m. Boston Dispensary. Injuries of the Epiphyses. Dr. John D. Adams.

*10 a. m. - 12:30 p. m. Tumor clinic. Boston Dispensary.

11:30 a. m. Carney Hospital. John T. Bottomley Society. Out-patient department.

8:30 p. m. Greater Boston Medical Society. Beth Israel Hospital auditorium.

Wednesday, March 2

*9-10 a. m. Boston Dispensary. Hospital case presentation. Dr. S. J. Thannhauser.

*12 m. Clinicopathological conference. Children's Hospital Amphitheater.

Thursday, March 3

8:30-9:30 a. m. Exchange visit, surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals, held this week at the Children's Hospital.

*9-10 a. m. Boston Dispensary. Social Instability and the Doctor. Prof. Elton Mayo.

*4 p. m. George Washington Gay lecture. Tufts College Medical School.

5 p. m. Faulkner Hospital, clinicopathological conference.

Friday, March 4

*9-10 a. m. Boston Dispensary. Mumps. Dr. Conrad Wesselhoeft.

*10 a. m. - 12:30 p. m. Tumor clinic. Boston Dispensary.

12 m. Clinical meeting of the Children's Medical Service, Massachusetts General Hospital, Ether Dome.

Saturday, March 5

*9-10 a. m. Boston Dispensary. Hospital case presentation. Dr. S. J. Thannhauser.

*10 a. m. - 12 m. Staff rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Henry A. Christian.

Sunday, March 6

4 p. m. Illustrated, public, health lecture, Faulkner Hospital auditorium. Chest Operations in the Treatment of Tuberculosis. Dr. Harlan F. Newton.

4 p. m. Free public lecture. Harvard Medical School, amphitheater of Building D. Heart Disease. Dr. Herrman Blumgart.

4 p. m. Free public lecture. Beth Israel Hospital, Boston, in conjunction with the Women's Auxiliary. What Can Be Done in Arthritis. Dr. Armin Klein.

*Open to the medical profession.

February 24 — Boston Society for the Advancement of Gastroenterology, 12 noon, Boston City Hospital.

February 24 — Trudeau Society, 8:15 p. m. Beth Israel Hospital auditorium.

February 24 — Robert B. Brigham Hospital, 125 Parker Hill Avenue, Boston, at 8:15 p. m.

February 25 — Massachusetts Psychiatric Society. Page 245, issue of February 3.

February 25 — Boston Dispensary, medical conference. Page 367.

February 25 — New England Pediatric Society. Page 368.

February 28 — New England Heart Association. Page 368.

March 1 — Greater Boston Medical Society. Beth Israel Hospital auditorium, 8:30 p. m.

March 1 — Carney Hospital. John T. Bottomley Society. Page 368.

March 1-31 — Boston Dispensary, medical conference program. Page 367.

March 3 — George Washington Gay Lecture. Page 245, issue of February 3.

March 3 — Faulkner Hospital. Clinicopathological conference. Page 368.

March 7 — Boston University Medical Society. Page 368.

March 8 — Harvard Medical Society. Page 368.

March 10 — Pentucket Association of Physicians. Hotel Bartlett, 95 Main Street, Haverhill, 8:30 p. m.

March 10, 11, 12 — New England Hospital Association. Page 51, issue of January 6.

March 21 — Boston Medical History Club. 8:15 p. m., Boston Medical Library.

March 28 - April 1 — Postgraduate Institute of the Philadelphia County Medical Society. Page 282, issue of February 10.

April 4-8 — The American College of Physicians. Page 41, issue of July 1.

April 26 — New England Society of Psychiatry. Page 362, issue of February 17.

May 31, June 1 and 2 — Annual meeting of the Massachusetts Medical Society. Hotel Bradford, Boston.

June 13-17 — American Medical Association. San Francisco.

June 13, October 8 and November 15 — American Board of Ophthalmology. Page 282, issue of February 10.

October 17-21 — Clinical Congress of the American College of Surgeons, New York City.

District Medical Societies

BRISTOL SOUTH

May 5 — 5 p. m., New Bedford.

ESSEX SOUTH

March 2 — Lynn Hospital. Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced.

April 6 — Gloucester Hospital, Gloucester. Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced.

May 5 — Censors meet at Salem Hospital, 3:30 p. m.

May 11 — Annual meeting, Salem Country Club, Peabody. Dinner at 7 p. m. Speaker and subject to be announced.

FRANKLIN

Meetings will be held at the Franklin County Hospital, Greenfield, at 11 a. m. the second Tuesdays of March and May.

HAMPDEN

Meetings will be held on the fourth Tuesday in April and July.

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club, Stoneham, at 12:15 p. m. on March 16, and May 11.

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club, Lowell, on April 27.

NORFOLK DISTRICT

March 29 — Hotel Kenmore. 8:15 p. m. Subject to be announced but to be related to diseases of the kidney. Dr. Albert A. Hornor.

May — Annual meeting.

The censors meet on the first Thursdays of May and November in each year.

NORFOLK SOUTH

Meetings held at 12 noon.

March 3 — Norfolk County Hospital, South Braintree.

April 7 — At the Quincy City Hospital.

May 5 — Annual meeting.

PLYMOUTH

Meetings will be held at 11 a. m. on March 17, April 21, May 19 and July 21.

SUFFOLK

March 15 — Joint meeting with Boston Obstetrical Society.

WORCESTER

At the following meetings, except the annual meeting, dinner will be at 6:15, to be followed by business session and scientific program.

March 9 — Memorial Hospital, Worcester.

April 13 — Hahnemann Hospital, Worcester.

May 11 — Afternoon and evening, annual meeting. Place and schedule of program to be announced.

BOOK REVIEWS

The Cerebrospinal Fluid. H. Houston Merritt and Frank Fremont-Smith. 333 pp. Philadelphia and London: W. B. Saunders Company, 1937. $5.00.

Previous books on the cerebrospinal fluid, as pointed out by Dr. J. B. Ayer in the foreword, are now outmoded, for they were written too early in the history of clinical investigation of the spinal fluid to be able to present accurate correlation between laboratory and clinical findings. This fine book, which originally was started in the Spinal-Fluid Laboratory at the Massachusetts General Hospital and later continued in the laboratory of the Neurological Unit of the Boston City Hospital, is based on the examination of approximately 21,000 spinal fluids from patients whose diagnoses have been verified. The volume consists of a brief historical introduction, excellent chap-

ters on the anatomy and physiology of the cerebrospinal fluid, its chemistry and pathologic physiology, the technic of lumbar puncture, the cerebrospinal fluid syndromes and methods of laboratory examination, and an extensive bibliography and index. The volume is illustrated by numerous charts and tables. The subject is covered very completely, and the volume will become an essential part of the equipment of any first-class laboratory or hospital, as well as an important addition to the library of all medical practitioners.

In turning over the pages, it is interesting to note that the authors hold the view, now almost universally accepted, that the choroid plexus is the site of origin of the spinal fluid, that its exit from the ventricles is through the foramina of Luschka, and that the supposed foramen in the midline of the fourth ventricle, as described by Magendie, is probably not a functional opening, and that the evidence favors Mestrezat's theory that the cerebrospinal fluid is a dialysate. The function of the spinal fluid is probably a mechanical one, as described by Magendie in 1842. Puzzling points, which have often bothered practitioners, are explained. It has been erroneously claimed that the irritation of a simple lumbar puncture may cause meningeal reaction, which is manifested by a pleocytosis at a subsequent puncture. The authors found no evidence of such a reaction. They have devised a technic by which bloody fluid obtained at lumbar puncture as the result of imperfect withdrawal may be evaluated so that the actual white-cell count and protein may be estimated. They have not found any treatment efficient in post-lumbar-puncture headache, except the postural one of keeping the patient in a horizontal position. They point out that the colloidal gold reaction is no longer thought to be diagnostic of any particular disease of the central nervous system, but is simply an indication of an abnormality of the protein content of the fluid. For this reason they have wisely discarded the prejudicial terms "paretic," "syphilitic" and "meningitic" curves and have replaced them by the terms "first-zone," "midzone" and "end-zone" curves.

The value of this book lies in the accumulated and carefully analyzed data from a large series of cerebrospinal fluids, and all the syndromes as seen in various diseases — material that has never been adequately presented to the medical profession before. Except for the reduction in the size of some of the charts, which has resulted in making them difficult to read, the reviewer has no criticism of this outstanding publication.

Not So Long Ago: A chronicle of medicine and doctors in colonial Philadelphia. Cecil K. Drinker. 183 pp. New York: Oxford University Press, 1937. $3.50.

In Philadelphia, back in 1758, the young matron Elizabeth Drinker began keeping a diary, and a diarist she continued to be almost to the end of her days in 1807. Now comes her great-greatgrandson to comb her journals for matters of medical interest and to make those matters into a book.

It was a rich lode which he struck. Elizabeth Drinker had nine children and twenty-five grandchildren, and the medical experiences of this numerous progeny and those of her husband, her servants and her neighbors were among her most pressing concerns all her life. The Drinkers were well-to-do folk and in her various and frequent exigencies she could command the best medical advice the times had to offer. Benjamin Rush, William Shippen, Adam Kuhn, Philip Syng Physick and John Bard — prominent names all in American medical history — appear repeatedly in her pages.

Yet these men, able, hard-working and conscientious as they were, could do but little (one sees now) to lessen the medical hazards that then beset life. Strong in system and theory they really possessed but a "minimum of fundamental knowledge." Even in Philadelphia, the largest and perhaps richest city in the colonies, there was no sanitation; hospital facilities were vastly inadequate; and what with typhoid, smallpox, dysenteries, yellow fever and other epidemic diseases there was a heavy mortality among the youthful. Of Elizabeth Drinker's nine children only five lived to maturity and one of these was for years in a precarious state from tuberculosis.

Very wisely Dr. Drinker groups his quotations according to subject rather than chronology. Thus one finds chapters on childbearing in 1790, on the tuberculosis of William Drinker, on smallpox and the fevers, on yellow fever in Philadelphia, and on medical practice in 1800. His own part in the exegesis is to supply the backgrounds and the broad settings, to introduce the people, to furnish the continuity, and on occasion judiciously to comment. But particular events are presented always through the eyes of his ancestress.

Viewed as a whole the book is a notable contribution to social as well as to medical history. It leaves one with a vivid sense of the life of a period, of what people must needs then endure of fleshly ailments, and of what vast strides medicine has taken since that time — after all "not so long ago." No one who is interested in the development of American medicine can afford to pass it by. Indeed, one might suppose that the layman would enjoy it almost as much as the physician. Dr. Drinker is to be heartily congratulated on his achievement.

Modern Treatment in General Practice. Volume 3. Edited by Cecil P. G. Wakeley. 436 pp. Baltimore: William Wood & Company, 1937. $4.00.

This is the third volume of selected papers reprinted from current issues of *The Medical Press and Circular* of London, England. The subjects are chosen with particular reference to the needs of general practitioners in that they deal primarily with diagnosis and treatment. They have been written by surgeons and physicians representing a fair cross section of skilled British practice.

There are fifty-one chapters, each one devoted to a special subject. Of this number six are allotted to cancer in various situations; eight to different problems in the realm of psychiatry, psychology, behaviorism and several organic, central-nervous-system diseases, such as sclerosis (disseminated), general paresis, epilepsy and cerebral syphilis. For the other subjects there are excellent discussions of intestinal obstruction, colitis, anal fistula, gastric and duodenal ulcers, esophageal obstruction; congenital dislocation of the hip, infantile paralysis, injuries to the wrist, harelip, injection treatment of varicose veins, industrial injuries to the hand and foot, and fractures of the pelvis and complications; treatment of edema, chorea, cirrhosis of the liver, cardiac failure, cholecystitis, acute rheumatism, prostatic enlargement, osteoarthritis, essential hypertension, hyperchromic anemia, chronic bronchitis and asthma; ophthalmic emergencies, traumatic abdominal emergencies and pulmonary suppuration; value of blood examinations to the general practitioner, tumors of pituitary gland, treatment of ringworm of the foot, tuberculosis of the skin, acute pyelitis, histidine treatment of peptic ulcer, and treatment of angina pectoris; the modern treatment of dysentery and dietetic essentials for the general practitioner. The above is nothing more than the table of contents. It would be impossible to give space to a detailed review of each article, but suffice it to say that they are written uniformly well and present modern English opinion in a clear-cut, practical manner.